GEOMETRY KI·TAP
BAK I & II
FOR
MIDDLE CLASSES IN GARO

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Published by
Tura Book Room, West Garo Hills.
Tura, Meghalaya

&
Printed by
Jay Kay Enterprises
Gauhati-781 001

JANAPCHENGANI

Anga ia kitapko middle classrango jakkaltona gita A·chikkuchi seaha.Da·odipet A·chik bi·sarangna indakgipa kitaprangko A·chikkuchi segimin komibeenganí gimin ia kitap poraienggipa A·chik chatrochatrirangna aditan jakkaltogipa ong·gen ine anga bebera·a.Ia kitapko Meghalaya Board of School Educationni authorityrangba text book dake jakkalna approve ka·pagen ineba anga ka·donga.

Ia kitapko namdapatani bidingo saoba maiba kupattiani gnangode angona uiatpachina mol·mola.

Kitapko segipa,
Dist.Science Supervisor,
West Garohills, Tura.

JANAPCHENGANI.

Anga Geometry Bak-II-ko Middle classrango jakkaltona gita Achikkuchi seaha. Ia angni segimin gnigipa kitapo Geometryni dingtang dingtang bimangrangko noksa sale mesokanirang aro uarangko noksa salani niamrangko mongsongbate nikna man· gen. Iarangna agreba Geometryni adita ming problemrangkoba ia kitapo man· chapataha.

Ia kitapko namdapatna saoba maiba kupattiani gnangode, uarangko angona uiatpaode mittelbegen. Anga uarangko ra·chaksona kusi ong·gen.

Kitapko segipa,
Shri. H. Brill Momin., B.Sc,B.T.,
Dist Sceince Supervisor,
West Garohills, Tura.

KATTA BI CHONGRANG.

BAK-I

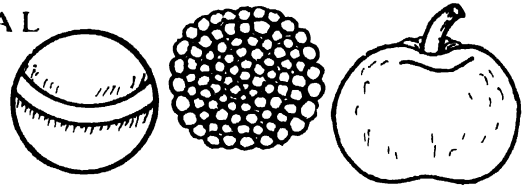
BAK-II

BAK-I

CHAPTER-1

An·ching bang·bea bosturangko an·chingni samtangtango nikna man·a, aro uarang ge·sa ge·gipinoni bimango dingtanggrika. Adita bosturangni bimangrangko ka·mao noksa baksa mesokenga.

SPHERICAL
BA
SHPERE



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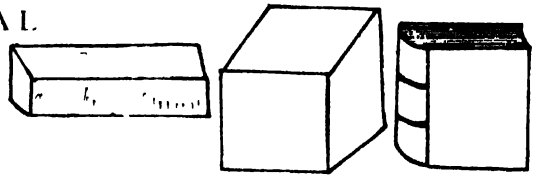
BA
CUBOID



CYLINDRICAL
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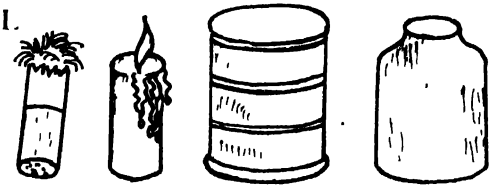

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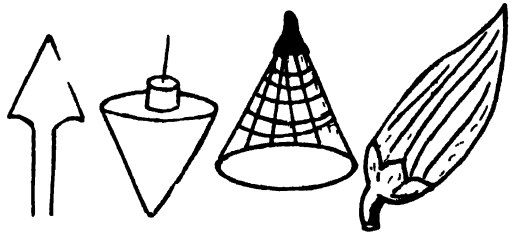
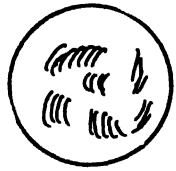


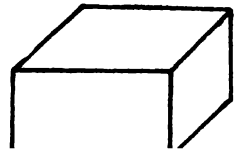
EXERCISE-1

1. Ka·mao mesokgipa bostu mingprakni ka·mac bimangni bimungko see mesokbo.

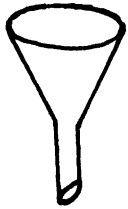
Chi ring.chakani Mug.



Robol.

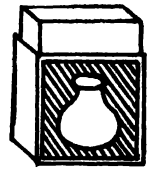


Bakos.

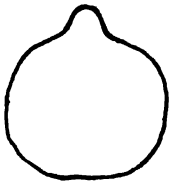


Chochoki.

Wa·tok.

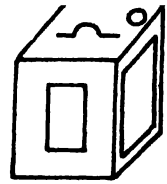


Dislai bikop.

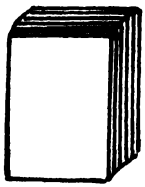


Bol-bite.

Mula.



Kerosene Tin.



Kitap.

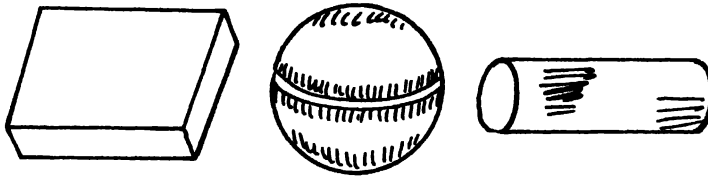
Pencil ku·chot.

Krong dotsa.

2. (a) Cylindrical bimangrangko ming 3 noksa sale mesokbo.
   (b) Cuboidal bimangrangko ming 3 noksa sale mesokbo.
   (c) Conical bimangrangko ming 2 noksa sale mesokbo.
   (d) Spherical bimangrangko ming 2 noksa sale mesokbo.

CHAPTER-2
PLANE SURFACE

Je Bostuni bakkon an.ching nikna aro jakchi dangtape nina man·a uandakgipa bakrangkon surface ine minga.Ka·mao mesokgipa bosturangni surfacerangko namedake nibo.



An·ching sronggipa go·ol ge·sako ra·e bolplengni kosako je rokom dakeba done nina man·a.Go·ol bolplengni kosakgipa bako ba surfaceo pilak bakrangon nangdika ine nikna man·a.Unigimin, bolplengni surface plane ong·a ine aganna man·a.

An·ching robolni kosako go·olko done niskana-.Go·ol robolni banggija bakrangosan nangdikaia ine nikna man·a.Unigimin robolni surfaceara plane ong·ja

(ga·nangja) inc uina man·a.

Da·ode an·ching go·olko wa·singtokni kosako done niskana. Go·olko wa·singni ro·a joljol donon go·ol wa·singni pilak bakrangon nangdika inc nikna man·a, indiba apsan go·olko wa singtokni kosako dambenge donskaon go·ol wa·singni kosako banggija bakrangosan nangdikaia inc nikna man a.Unigimin, wa·singtokni surfaceara plane ong·ja inc uina man·a.

Lekkani surface plane ong a.Una agreba kelki aro do·garangni surfacerangba plane ong a.

EXERCISE-II.

1. Plane surface donggipa bosturangko ming 4 mingbo.
2. Glaxo tinni mitam surface plane ong·a aro mitam plane ong·ja, Indakgipa bosturangni bimungrangko ming 3 mingbo.

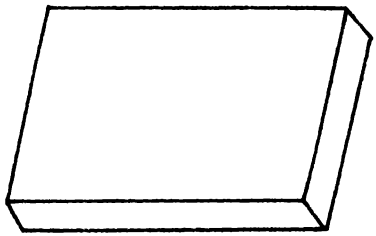


Fig-I

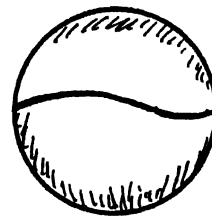


Fig-II

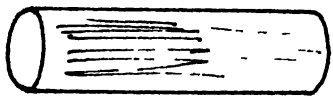


Fig-III

Fig-IV

3 Ka mao mesokgipa noksarangko nie badia bosturangni surface plane ong a aro badia piane ong ja on gimin bostu mingpraknı ka mao see mesokbo

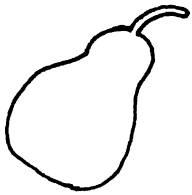


Fig V

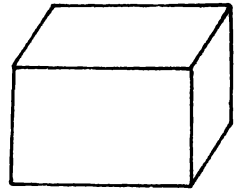


Fig-VI

Fig- VII

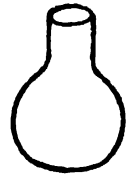
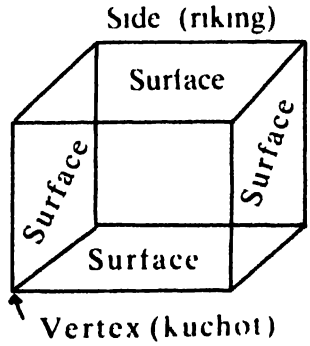


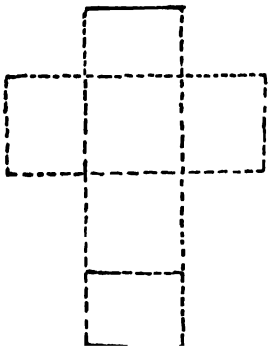
Fig-VIII

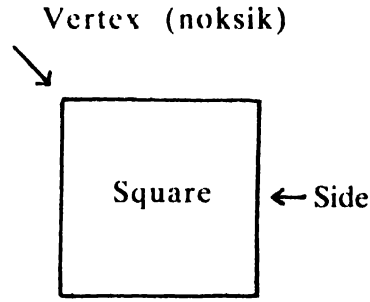
CHAPTER-III.
DOTGIMIKGIPA BIMANGRANG.
(Solid figures)

1 **CUBE. :**
Cubeni bimangko surface ge dokchi duula Cube ge·sao siderang (rikıng) ge 12 aro noknik (vertex) ge 8 gnang. Surface ge praknı pılak siderangan apsan ong·a.Pılak siderangan apsan ong gipa surface ge 6 chi duulgipa bimangkon CUBE ine minga.



Cubeni bimangko ong·atgipa surfacerangko niode, Surface ge·prakni siderang ba rikingrang aro noksikrang (vertices) pilakan apsan ong·a ine nikna man·a.Unigimin Cubeni surface ge·prakni bimang square ong·a ine uina man·a.

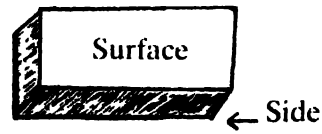




Chatro-chatrirangko lekka ba·ao kosako.mesokgipa noksako saldape uarangko mesokgimin linerang gita (dotted lines) uarangko tem e Cubeni bimangko tariatbo.Uamangko surface ge·prakko ge·sa ge·gipin baksa dondape uarang apsan ong·ama ong·ja dake niatbo.

2. **CUBOID :**

Jakrachi Cuboidni bimangko mesoka.Cuboid-oba Cubeo gitan surface ge 6, siderang 12 aro noksikrang ge 8 gnang.Indiba Cuboido uni surfacerang ge·sa ge·gipin baska apsan ong·ja, indiba uni mikkanggrikgipa surfacerangsan apsan



Cuboid

ong·aia.Dotgimikgipa bimangni mikkanggrikgipa surfacerangsan apsan ong·aiode indakgipa bimangko Cuboid ine minga.

Cube aro Cuboidni dingtanggrikanide Cuboido mikkanggrikgipa surfacerangsan apsan ong·aia,indiba Cubeode pilak surfacerangan ge·sa ge·gipin baksa apsan ong·a.

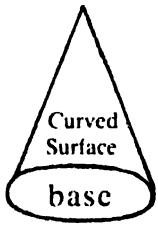
3. **CYLINDER** Jakrachi Cylinderni noksako mesoka. Ian chi ringchakani mug ba wa·sing-tokni bimang gita dakanga. Iano surface ge·gitam gnang.Kosakgipa aro ka·magipa surfacerang plane surface-rang ong·a.Ua surface ge:gniko duulgipa surfaceko curved (gonggegipa surface) minga. Cylinderni bimango noksikrang (vertex) dongja. Cylindero plane surface ge·gniko uni base ine minga.

CYLINDER

4. **SPHERE :** Sphereni noksako jakrachi mesoka. Ian bim·romgipa bimang ge·sa ong·a. Ia bimango side aro noksikrang dong-ja. Ia bimangko surface ge·sachisan duulaia aro surfaceba plane ong·ja. Je bimangon surface ge·sasan dongaia, indakgipa bimangko sphere ine minga.


SPHERE

5. **CONE :** Cone-ni bimangko jakrachi mesoka. Ianc surface ge·gni gnang.Plane surface ge·sa jekon Cone-ni base ine minga. Ia bimange noksik ge·sasan dongaia. Iandakgipa bimangkon Cone ine minga.



Cone

EXERCISE-III.

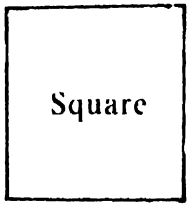
1. Cuboidni bimang dakgipa bosturangko ming 3 mingbo.
2. Cylinderni bimang dakgipa bosturangko ming 3 mingbo.
3. Cylindero badita ge surfacerang gnang aganbo. Uarangoni badiagipa surfacerang ge·sa ge·gipin baksa apsan ong.a aganbo.
4. Cubeni bimang dakgipa bosturangko ming 2 noksa sale mesokbo.
5. Cone-ni bimang dakgipa bosturangko ming 3 mingbo.
6. Maina robolko Cube ba Cuboidni bimango tarija, indiba Sphereni bimangosa taria, nang·ni uia gita aganchakbo.
7. Coneni bimango badita noksik aro surfacerang gnang aganbo.
8. Sipairangni tambuni bimang maigita daka aganbo. Maina tambuko indake taria aganbo

CHAPTER-IV.
PLANE SURFACERANG.

An·ching bang·a dingtang dingtang bimangrangan surfacerangchi duula inc nikna man·a.Surfaceni biman-rangba bimangni kri dingtang dingtang ong·a.Ang-·ching surfacerangni gimin sandie niangkuna.

1. **RECTANGLE** Cuboidni bimangko ong·atgipa surface ge·prakan rectangle ong·a. Ua surface ge·prako noksik ge 4 gnang. An·chingni Exercise bohiba rectangleni bimang gita daka.

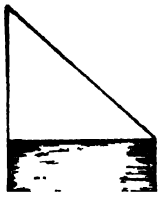
2. **SQUARE** Cubeni bimangko ong·atgipa surface ge·prakan square ong·a.Square-oba rec-tangleo gitan side ge 4 aro noksikrang ge 4 gnang. Indiba squareo side ge.-prakni ro·an ge·sa ge(gipin baksa apsan ong·a.



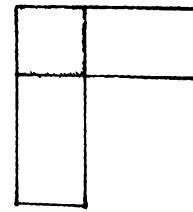
SQUARE aro RECTANGLE ni dingtanggrikani.

Squareo pilak siderangan apsan ong·a, indiba rectangleo mikkang-chakgrikgipa siderangsan apsan ong·aia.

Square aro Rectangleni bimangrangko dake mesokani.

1. **(a) SQUARE**  Squareni bimangko tarina rectangle ong·gipa lekka kingsako ra·e jakasi-chi noksao mesoka gita tem·bo. Tem·a gitchagipa lekkako rate gal-bo. Tem·a-ko badalon Square ni bimangko man·-gen.

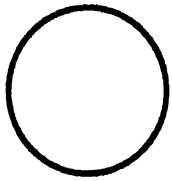
(b) Rectangleni bimangogipa apsan dal·gipa lekka kinggniko jakrachi mesokgipa gita kingsa kinggipinko don-dapbo. Don-dapa gitchagipa lekkako rate galbo. An·ching Square ge·gniko man·gen.



2. **RECTANGLE** 

Rectangle

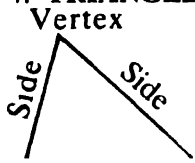
Nang·ni exercise bohioniko lekka kingsako chite uni noksik samg-niko gipin noksik samgni baksa meliate tem·bo.Mikkanggrikgipa nok-sikrang aro mikkanggrikgipa siderang apsan ong·ama ong,ja dake nibo.

3. **CIRCLE :** 

Circle

Ian garichakani bimang gita dakanga. Cylindero indakgipa surface ge·gni gnang aro Cone-ni bimango ge·sa gnang-.Circleo noksikrang dongja. Na·a jaksan ba paisa gong·sani bimangko lekkako done saldulode circleni bimangko nikgen.

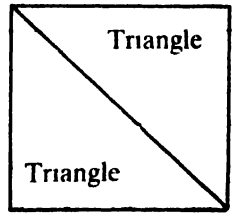
4. **TRIANGLE** Ian side ge·gitam aro noksik ge·gitam gnanggipa bimang ge·sa ong·a.Bimangni side ge·gni nok-sik ge·prakko ong·ata.Indakgipa bimangko Triangle ine minga.



Triangle

Triangleko dake mesokani.

Square ong·gipa lekka kingsako ra·e uko mikkanggrikgipa noksikrangko apsan tem·bo. Tem·gimin bimang triangle ong·a.Tem.gipa lekkako tem.ajoljol ratode triangle ge·gniko man·gen.



EXERCISE-IV.

1. On·gimin noksarangoniko rectangleni bimangko sandibo.

Fig-I

Fig-II

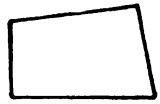


Fig-III

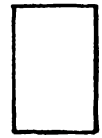


Fig-IV

Fig-V

2. Ka·mao on·gimin noksarangoniko squareko mesokbo.

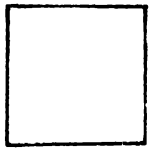


Fig-I

Fig-II

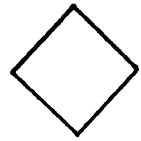


Fig-III

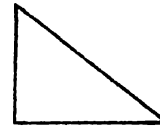


Fig-IV

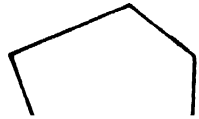


Fig-V

3. Circleni bimang gnanggipa bosturangko ming 3 noksa sale bimung donbo.
4. Maina motor garini chakkarangko circleni bimango taria chanchie aganchakbo.
5. Square ong· gipa lekka kingsako ra·e uko mikkang-grikgipa ku·chot ge·gniko nangrimate apsangrik tem·bo.Tem·ako badale na·a badita triangle ge ko ong·atna man·a dake nie aganchakbo.
6. Ka·mao mesokgipa noksarango badita ge triangle-rangko nika chane aganbo.

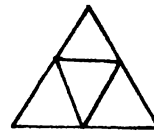


Fig-I

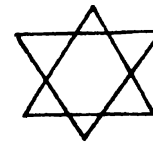


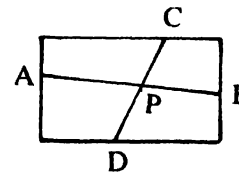
Fig-II

CHAPTER-V.
POINT ARO LINE-SEGMENT.

An·ching rectangle, square aro trianglerangni gimin adita skie ra·baaha. Ua janapgipa bimang

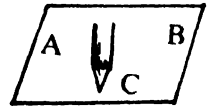
ge.prakon line-segment aro noksikrang gnang. Tableni rikingrang ba siderang line-segmentrangko mesoka.

POINT : Pointni miksonganiko an.ching mingsa dake mesokanichi talatna man.a. Jekai, an.ching lekka kingsako tem.ode tem·ani chinko nikna man.a. Apsan lekkakon skanggipa chinko tem·dape gipin chinko ong·atna man·a. Ua chin ge·gni biap damsao batsotgrika ine nikna man·a. Ua batsotgrik-ram biapan Point ge·sa ong·aha. Jekai,



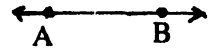
Kosako mesokgipa noksao lekka kingsako tem·on AB chinko nika. Apsan lekkako tem·taie CD chinko nikna man·a.Da·o AB aro CD biap ge·sao batsotgrika ine nikna man·a. (Chong.motan P pointo) Unigimin P point ge·sa ong·aha.

Minggipin, Pointni miksonganiko lekkao pencilchi su·tote chinko dakachi mesokna man·a.Plane ge·sao pointrangko mesokna Oikorrangko jakkala, Jekai,



Kosako Point ge·gitamko mesoka.Uarang A,B aro C pointrang ong·a. Plane ge·sao channa amsokgija pointrang dongna man·a.

STRAIGHT LINE : Exercise bohi, kitap, ruler ba tableni rikingko straight line ba sronggipa line ine chanchina man·a.Jekai,

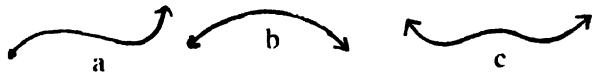


Kosako mesokgipa noksao AB line ko mesoka.Line ge·sao bang·bea pointrang dongna man·a Lineni samtangtangchi bra ku·chotrangko donani miksongania, line jechiba bariangna man·a ine mesoka.

An·ching rong·teo kilding ka·e kilding ku·chot samsako rim·e uko dingdeode uaba Straight lineni bimangko mesoka.Jekai,

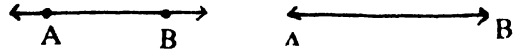
Chongipa oikorrangko jakkaleba Lineko biming dona.Jekai, "l" line, "m" line.

CURVED LINE BA GONGGEGIPA LINE : Curved line ba gonggegipa line ko ka·mao mesoka.Jekai, a, b, c, etc.



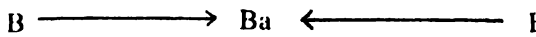
LINE-SEGMENT : Ka·mao line segmentni noksako mesoka.Lene-segmentara line ge·sani baksan ong·aią. (part of a line). Line segmentko samtangtangchi point ge·gnio bon·chotate sala.Jekai, AB line-segment aro CD line-segment.

Line aro Line-segmentni dingtanggrikaniko ka mao noksachi mesoka. Jekai,

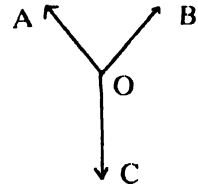


AB line AB line-segment.

RAY : Line ba line-segmentko "Ray" ineba jakkala. Ray-ni orto teng·suani ja·dil ong·a.Jekai,



B pointko Ray-ni ku·chot (endpoint) ine minga.



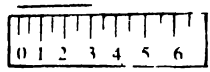
Kosako ray ge·gitamko mesoka.Jekai, OA ray, OB ray aro OC ray. Jensalo line ge·gni batsotgrika uarang pangnan point ge·sao batsotgrika.Jekai,

Skanggipa noksao (Fig1) CD line aro OA line O pointo batsotgrika. Gnigipa noksao (Fig2) AB aro CD

linerang X pointo batsotgrika. Gitamgipa noksao (Fig3) RQ aro RP linerang R pointo batsotgrika.

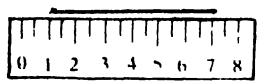
LINE-SEGEMTNKO TOANI.

An·ching metre scale, ba rulerko jakkale line-segmentni ro·aniko tona man·a.Line-segmentni ro·ako tona salgimin line-segmentni ku·chot samsao scaleni Zero chinko tiktak done scaleni rikingko salgimin line-segment baksa joljol nangchapate donbo. Line scaleni baditaona soka uan line-segmentni ro·ani ong·a-.Jekai,

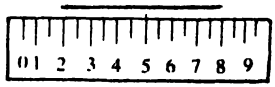


Kosako mesokgipa noksao line-segmentni ro·ani 3cm. ong·a.

Basakoba, scaleni zero chin cham:ahaon ba scale-ni samsachini be·tongahaon zero chinoni ro·aniko tona man·jawaha. Indake ong·on, an·ching ka·mao noksao mesoka gita line-segmentni ro·aniko tona man·a.Jekai,



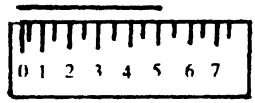
Iano line-segmentni ro·a (7-1) cm ba 6centimetre ong·a. Apsan dake,



Iano lineni ro·ani (8-2)cm. ba 6cm.ong·a.

JANAPGIMIN RO'ANI GITA LINE-SEGMENTRANGKO SALE MESOKANI.

5Cm. ro· gipa line-kŏ salna an·ching scale ge·sako ra·e uko lekkani kosako done, scaleni rikingo segipa zero chin aro 5 chinni kosakŏ tongtong su·tote ra·chengbo. Uni ja·mano scaleni riking-joljol leadpencilchi line sale point ge·gniko nangrimatbo. Unon salgimin lineni ro·a 5Cm. ong·gen. Jekai,



NB : Skigiparang scaleko maikai linerangko salmitingo jakkalna nanga skibo. Scaleko kraa gita rake rim·jaode biap tang·jujae line salani tik ong·jawa.

EXERCISE-V.

1. Ka·mao on·gimin pointrangko numberrangni kri

1.

.2	1.	.2	1.	.2
.3	4.	.3	4.	.3
Fig-1		Fig-2		Fig-3

sulsul nangrimate uarang mai bimangrangko ong·ata aganbo.

2. Lekkao point ge·sako done uko batsote ge 6 line-segmentrangko sale mesokbo. Ge 6 na bateba line-segmentrangko salangkuna man genma dake nie aganchakbo.

3. Lekkao point ge·gniko done na·a badita linerangko uarangko batsote salna man·a sale mesokbo.

4. Apsan ritingo ong·gija point gegitamko dingtang dingtang biapo ra·e changprako point ge·gni gita batsote badita line-segment-rangko salna man·a sale mesokbo.

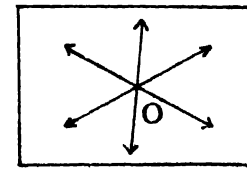
5. Point ge·briko dingtang dingtang biapo ra·e chang-prako point ge·gni gita batsote badita ge line-segmentrangko salna man·a sale mesokbo. Point ge·gitamko apsan ritingo ra·na nangja.

6. Ka.mao janapgimin line-segmentrangko noksa salbo.
(1) 3.5Cm. (2) 2·7Cm. (3) 4·6Cm. (4) 5 9Cm. (5) 7·3Cm.

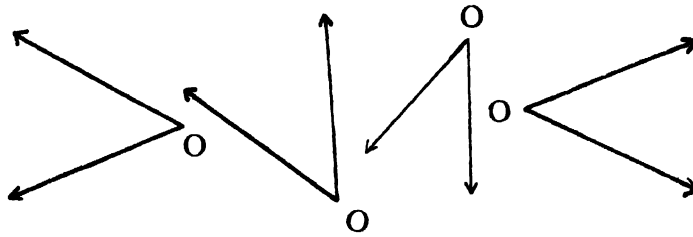
CHAPTER-VI.

A N G L E.

An·ching lekkao point ge·saoni banga line-segment ba ray-rangko salna man·a. Jekai.



Kosako salgimin bimangni je ray ge·gniko O pointko ra·e noksa salode indake nikna man·a. Jekai,



Ia kosako mesokgipa bimang ge·prakan angle ong·a. Unigimin an·ching point ge saoni ray ge·gniko sale Angle ge·sako dakna man a. Angle ge·sako ong·atgipa ray ge·gnikon Angleni jakpong-rang (arms) ba siderang ine minga. Uarangni gronggrikgipa point-kon angleni vertex (ku·chot) ine minga.

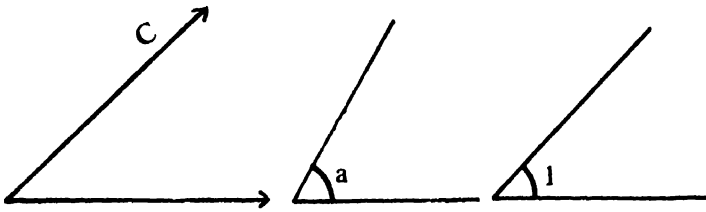


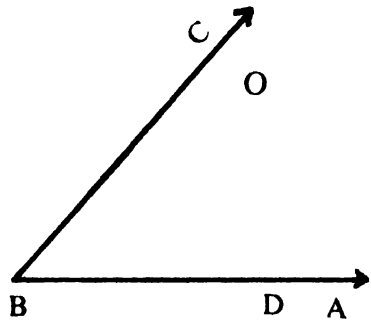
Fig-I Fig-II Fig-III

Kosako mesokgipa noksarango skanggipa noksao (Fig.1), angleni vertex B ong·a aro BC aro BA angleni siderang ba rayrang ong·a. Kosako mesokgipa angleni bimung ABC ba CBA ong·a. Angleko bimung mingon pangnan angleni vertexko mesokgipa Oikor bijatchio

ong·ronga ine nikna man·gen. Kosako mesokgipa ABC ba CBA angleo angleni vertex B pangnan bijatchio ong·a ine nikna man·a.

Angleko mesokna "∠" chinko jakkala. Jekai angle CBA ba angle ABC ko "∠ABC" ba "∠CBA" indake see mesokna man·a. Basakobade angleko noksa 2(Fig2) aro 3-o(Fig3) mesoka gita see mesokna man·a. Jekai, "a" ba "∠1".

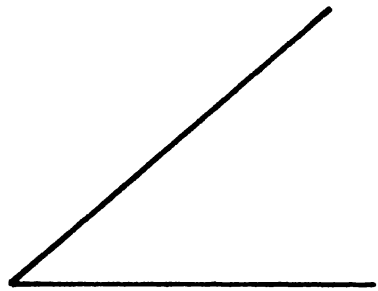
Angle ABC ni ning·o an·ching ge·sako ra·ode ua pointko angle ABC ni ning·o ine minga. Uandake point ge·sako angle ABC ni a·palo ra·ode ua pointko angle ABC ni a·palo ine minga.Jekai,



O point angle ABC ni ning·o aro D point angle ABC ni a·palo ong·a. Na·aba nang·ni jakskuko tem·e angle ge·sako dakna man·a.Nang·ni jakskuan angleni ku·chot ba vertex ong·a.

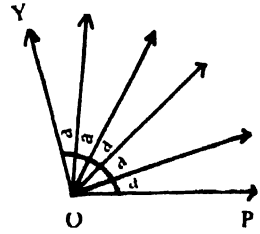
Minggipin gol·sri ge·gniko ra·e uarangko ka·mao

mesoka gita uarangko donc angle ge·sako dakna man·a. Jekai.



ANGLERANGKO TOANI.

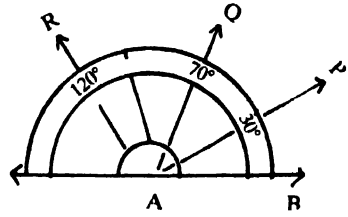
Angle ge·sako tona an·ching unit angle ge sako nanga.Jekai, ∠POY ∠a na chang 6 dal'batode, indide ∠POY ko ∠a ni chang 6 ba ∠POY=6a indake see mesokna man·a.



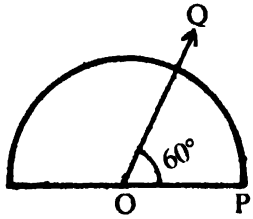
Anglerangko tona an·ching PROTRACTOR ko jakkala.Protractorko name niode O-oni 180° ona chin dakaniko nikna man·a.Sualgimín chin ge·prakan angle-ni dal'ani ba degreeko mesoka. Degree-an angleko

toani Unit ong·a. An·ching angleni degreeko mesokna "o" chinko jakkala.

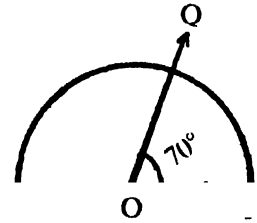
∠ BAP ko toanio uni dal·ani 30° ong·ode uko ka·mao mesoka gita see mesokna man·a.Jekai, ∠BAP=30° ; ∠BAQ=70° aro ∠BAR=120°.



Da·o ∠ POQ ni dal·aniko protractorchi tona, protractorni bijatchigipa pointko ∠ O point baksa nangrimatbo. aro AP sideko protractorni jakrachini zero chin baksa meliatbo.OQ side protractorni badita degreeni chin gita batsotanga nibo. Ka·mao mesokgipa noksao OQ line protractorni 60 segipa chin gita batsotanga. Unigimin ∠ POQ ni dal·ani 60° ong·a.Chong·motan ∠ POQ=60°.



∠POQ=60°



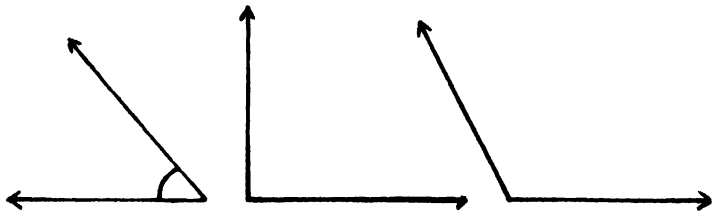
∠POQ=70°

Uandake an·ching angle 70° ko salna nangode, line ge·sako chong·motan OP lineko sale ra·chengbo.

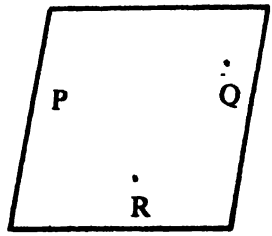
Uni Ja·mano protractorni bijatchigipa pointko O point baksa nangrimate protractorni jakrachi segipa zero chinko OP line baksa meliatbo. Uni ja· mano Protractorni angleni degreerangko jakraoni jakasiona chanange 70 chinni kosako tiktak Q pointko su.tote ra·bo.Protractorko ra·gale O aro Q ko line chi nangrimatbo. Da·o ∠POQ ni dal·ani 70° ong·aha.

EXERCISE-VI.

1. Ka·mao salgimin anglerangna bimungrangko donbo.Angle ge·prakni vertex aro siderangko janapbo.

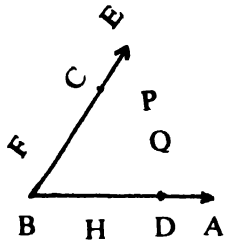


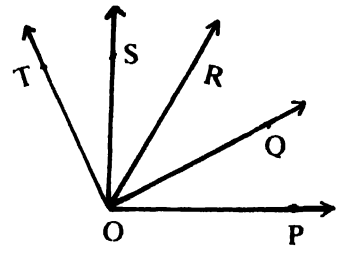
2. Plane ge·sao P,Q aro R pointrangko on·soaha. On·gimin pointrangko nangrimate ka·mao janapgim-



in angle ge·prakni vertex aro siderangko mingbo.
(i) ∠PQR. (ii) ∠QRP. (iii) ∠RPQ. (iv) ∠PRQ.

3. Ka·mao mesokgipa noksaoniko nie badia pointrang ∠ABC ni ning·o aro a·palo ong·a mesokbo aro badia





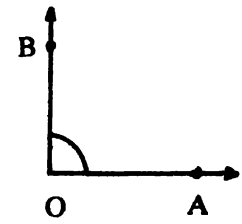
pointrang ∠ABC baksa tiktak melia ukoba mingbo.

4. Jakrachini noksaoniko nie janapgimin anglerangni dal·roroangani kri sulsul biming donbo.
∠POT, ∠POR, ∠POS, ∠POQ.

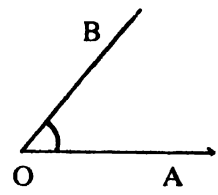
5. Ka·mao janapgipa anglerangko noksa sale mesokbo. (1) 15°. (ii) 90°. (iii) 65°. (iv) 105°. (v) 115°. (vi) 180°. (vii) 135°. (viii) 45°. (ix) 30° (x) 100°.

CHAPTER-VII.
ANGLENI ROKOMRANG.
(Kinds of angles).

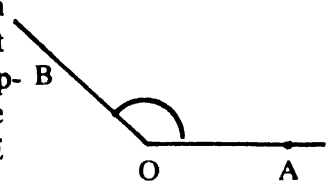
1. **RIGHT ANGLE :**
Je angleni degreean 90° ong·a, indakgipa angleko right angle ine minga. ∠A O B =90° (RIGHT ANGLE).



2. **ACUTE ANGLE ;**
Je angleni degreean 90° ba right angle ge·sana komia indakgipa angleko Acute angle minga. ∠AOB=ACUTE ANGLE.



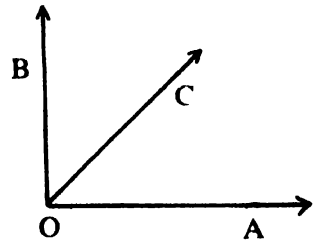
3. **OBTUSE ANGLE :**
Je angleni degreean 90° na dal' bata indiba 180° ba right angle ge·gnina komia indakgipa angleko Acute angle minga. ∠AOB=OBTUSE ANGLE.



1. Apsan degree ong·gipa anglerang pilakan ge·sa ge·gipin baksa apsan ong·a.
2. Right angle ong·gipa ba 90° ong·gipa anglerang pilakan ge·sa ge·gipin baksa apsan ong·a.

4. **COMPLEMENTARY ANGLERANG :**

∠AOC+∠COB=90°

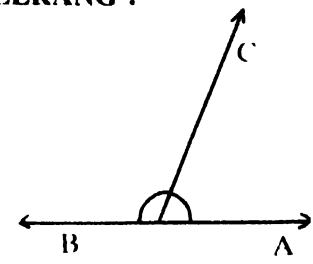


Kosako mesokgipa noksao ∠AOC aro ∠COB angle ge·gniko ra·dime 90° ba right angle ge·sako ong·ata. Uandake angle ge·gniko chandimani gimik right angle

ge·sa ba 90° ong·ode indakgipa anglerangko Complementary anglerang ine minga.

Mesokanina · ∠50° ni complementary angle 40° ong·a. (50°+40°=90°). Uandake 60° ni Complementary angle 30° ong·a.

5. **SUPPLEMENTARY ANGLERANG :**

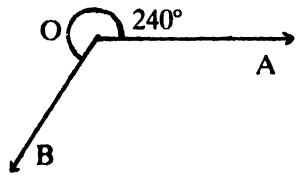


Je angle ge·gniko chandimani gimik 180° ba right angle ge-gni ong·a, indakgipa anglerangko Supplementary anglerang ineminga.Jekai, Jakrachi mesokgipa noksao, ∠AOC aro ∠COB ko ra·dimode uarang 180° ba Right angle ge·gni ong·a ine nikna man·a.Unigimin, ∠AOC aro ∠COB supplementary anglerang ong·a.

Mesokanina, ∠120° ni supplement angle 60° ong·a(120°+60°=180°).

Apsan dake, ∠110° ni supplement angle 70° ong·a(110°+70°=180°).

6. **REFLEX ANGLE.**

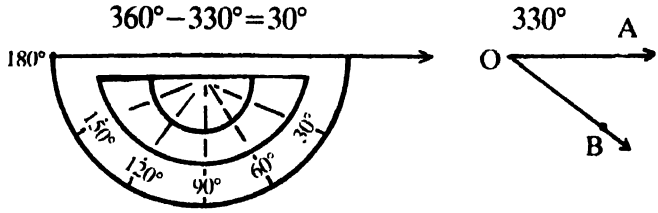


Angle ge·sani degree 180° na dal·batode indiba 360° ba right angle ge 4 na komiode indakgipa anglekon

Reflex angle ine minga.Unigimin ∠180° aro ∠360° ni ning·o donggipa je angleba Reflex angle ge·sa ong·na man·a.

REFLEX ANGLEKO SALE MESOKANI.

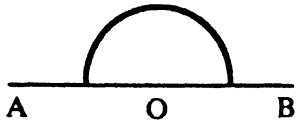
Reflex angle ge·sa chong·motan ∠330° ko sale mesokani.



Salani Niam :

1. On·gimin reflex angle ge·sako salna skang, ua angleko 360° niko changale bangki angleko kosako sale mesoka gita salbo.
2. Line ge·sako jekai OA line ko salchengbo.
3. Protractorko salgimin lineni ka·machipak done protractorni bijatchigipa pointko O pointo done angleko jakraoni jakasiona chanbae 30° ko chin dake ra·bo.
4. Protractorko ra·gale chin dakgipa pointko O point baksa scalechi nangrimatbo.
5. ∠AOB reflex angle ge·sa ong·aha aro uni degree 330° ong·a.

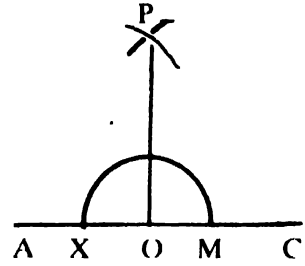
7. STRAIGHT ANGLE: Je angle ge·sani degreean 180° ba right angle ge·gni baksa apsan ong·a, indakgipa angle-ko Straight Angle ine minga. Jekai,



Kosako mesokgipa noksao ∠AOB ba∠BOA Straight angle ge·sa ong·a.

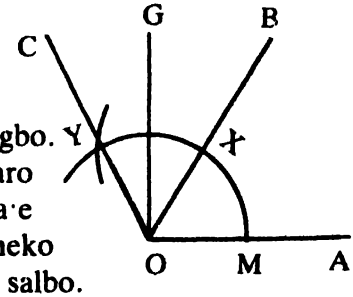
COMPASS ARO RULERKO JAKKALE ANGLERANGKO NOKSA SALE MESOKANI.

1. Angle 90°Ko Noksa salani.



(i) AC lineko salchengbo.
(ii) AC lineo O pointko centre ra·e compasschi ∠XOM ko salbo.
(iii) X aro M ko centre ra·e aro XM ko radius ra e arc ge·gniko P pointo batsotgrike salbo.
(iv) O aro P pointrangko linechi nangrimatbo. Da·o ∠XOP=∠POM=90°.

Minggipin Niam.



(i) OA lineko salchengbo.
(ii) O ko centre ra·e aro radiusko skatang ra·e arc ge·sako OA lineko M pointko batsote salbo.

(iii) M ko centre ra·e aro radiusko skang gitan apsan ra·taie skanggipa arcko X pointo saltongbo.

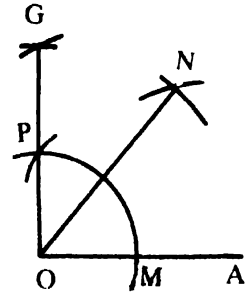
(iv) X ko centre ra·e radiusko apsan ra·kue skanggipa arcko Y pointo saltongbo.

(v) O,X aro O,Y pointrangko OB aro OC linerangchi nangrimatbo.

(vi) X aro Y ko centre ra e aro XY ko radius ra·e arc ge·gniko G pointo batsotgrike salbo.

(vii) O aro G ko linechi nangrimatbo.
Da·o ∠MOG°=90°

2. **Angle 45°ko Noksa salani.**



(i) Angle 90°ko kosako janapgipa je niamkoba jakkale salchengbo.

(ii) Salgimin angle jekai ∠MOG ko bisect ka·na nanga.

(iii) P aro M ko centre ra·e aro PM ko radius ra·e, arc ge·gniko N pointo batsotgrike salbo.

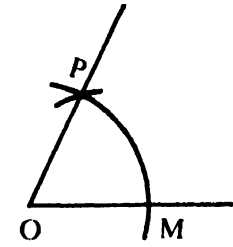
(iv) O aro N pointrangko linechi nangrimatbo.
Da·o ∠MON=∠NOG=45°

3. **Angle 60°ko Noksa salani.**

(i) OA lineko salchengbo.

(ii) O ko centre ra·e aro radiusko skatang ra·e OA lineko arc chi M pointo saltongbo.

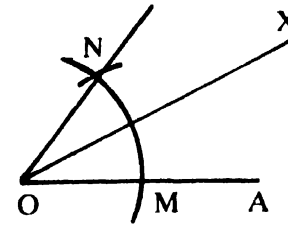
(iii) M ko centre ra·e aro radiusko apsan ra·taie skang salgimin arcko P pointo densotbo.



(iv) O aro P pointrangko linechi nangrimatbo. Da·o ∠MOP=60°.

4. **Angle 30°ko Noksa salani.**

(i) 60° angle ge·sako kosako mesokgipa Niamko jakkale salchengbo, Jekai, ∠MON.

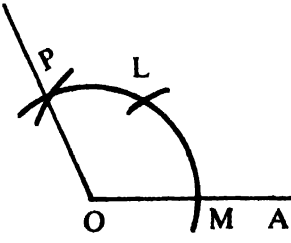


(ii) Uko bisect ka·na, M aro N ko radius ra·e aro MN ko radius ra·e, arc ge·gniko X pointo batsotgrike salbo.
Da·o ∠MOX=∠XON=30°.

5. **Angle 120°ko Noksa salani.**

(i) OA lineko salchengbo.

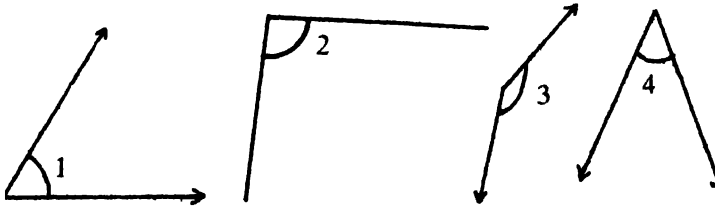
(ii) O ko centre ra·e aro radiusko skatang ra·e OA lineko arc-chi M pointo saltongbo.



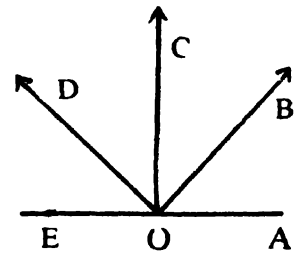
(iii) M ko centre ra·e aro radiusko apsan ra·taie skang salgipa arcko L pointo saltongbo.
(iv) L ko centre ra·e aro radiusko apsan ra·kue skang salgipa arcko P pointo saltongbo.
(v) O, aro p ko linechi nangrimatbo.
Da·o ∠AOP ba ∠MOP=120°.

EXERCISE-VII

Ka·mao sale mesokgimin anglerangoni badiagipa anglerang Acute, Obtuse, aro Right angle ong·a protractorchi toe nie aganbo.



2. (a) Jakrachi mesokgipa noksaoniko nie mai mai anglerang (a)Acute, (b)Obtuse aro (c)Right angle. (d)Straight angle ong·a anglerangni bimingko minge aganbo.



(b) Apsan noksaonikon (i) Complementary aro (ii) Supplementary anglerangko biming mingbo

3. Ka·mao jànapgimin anglerangni Complementrang-ko hisab ka·bo.
   (i) 35°. (ii) 55°. (iii) 19°. (iv) 70°. (v) 45°. (vi) 87°.
   (Angle 60°ni Complementary angle=90°-60°=30°.)

4. Ka·mao janapgimin anglerangni supplement anglerangko hisab ka·bo.
   (i) 55°. (ii) 120°. (iii) 100°. (iv) 75°. (v) 45°.
   (Angle 30°ni Supplement angle=180°-30°=150°.)

5. Ka·mao on gimin reflex anglerangko noksa salbo.
   (i) 200°. (ii) 260°. (iii) 320°. (iv) 340°..

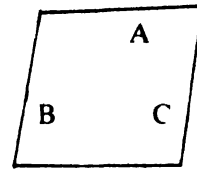
6. Ka·mao janapgimin anglerangni degreerangko hisab ka·bo.
   (i) Right angle ge·sani $^{1}/_{8}$ ($^{1}/_{8}$ of a right angle).
   (ii) Right angle ge·sani $^{4}/_{9}$ ($^{4}/_{9}$ of a right angle).
   (iii) Right anglee ge·sani $^{1}/_{10}$ ($^{1}/_{10}$ of a right angle
   (iv) Right angle ge·sani $^{7}/_{10}$ ($^{7}/_{10}$ of a right angle).

7. OA line ge·sako salbo.O pointko centre ra:e aro radiusko skatang ra·e OA lineko are ge·sachi P pointo saltongbo. P ko centre ra·e aro apsan radiuskòn ra·kue salgimin arcko ge·gipin arc chi Q pointo saltongbo.OQ ko scalechi nangrimatbo. Salgimin angleni degreeko (∠POQ) protractorchi toe badita ong·a aganbo.

CHAPTER-VIII
TRIANGLE

An·ching trianglerangni bimangrangko nok aro dolongrangko rikanirango nikna man·a.Indakgipa

bimangrangko nok aro dolongrango jakkale uarangko mangrakbatata.

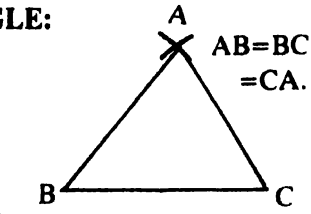


An·ching plane ge·sao point ge·gitamko ra·e uarangko linerangchi nangrimatode, ua bimangan Triangle ge·sa ong·a.Noksao ABC triangle ge·sako mesoka.A,B aro C pointrangko triangleni vertexrang minga. Trianglena "△" chinko jakkala. Unigimin Triangle ABC ko "△ ABC" indake see mesoka.

TRIANGLENI ROKOMRANG

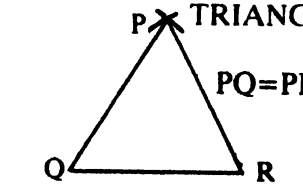
Trianglerangko uarangni side aro anglerangni kri bakgitam· dake sualna man·a.Jekai,

1. **EQUILATERAL TRIANGLE:** Triangle ge·sani pilak siderangni ro·an ge·sa ge·gipin baksa apsan ong·ode indakgipa triangle ko Equilateral Triangle ine minga.



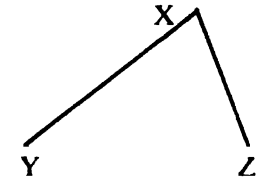
EQUILATERAL TRIANGLE.

2. **ISOSCELES TRIANGLE:** Triangle ge·sani side ge·gni ge·sa ge·gipin baksa apsan ong·ode indakgipa trianglekon Isosceles Triangle ine minga.



ISOSCELES TRIANGLE.

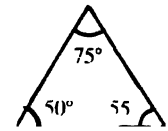
3. **SCALENE TRIANGLE:**
Je triangleni side- rangni ro·ani ge·sa ge·gipin baksa apsan ong·jaode indakgipa trianglekon Scalene Triangle ine minga.



SCALENE TRIANGLE.

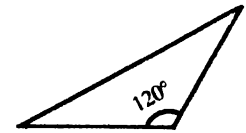
Trianglerangko Anglerangni krı bak 4dake sualna man·a.

1. **ACUTE-ANGLED TRIANGLE:**
Triangle ge·sani angle ge·prakan right angle ge·sana komiode indakgipa triangleko Acute-angled Triangle ine minga.



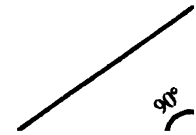
ACUTE-ANGLED TRIANGLE.

2. **OBTUSED-ANGLED TRIANGLE:**
Triangleni angle ge·sa right angle ge·sana dal.batode indakgipa trianglekon Obtused-Angled Triangle ine minga.



OBTUSED- ANGLED TRIANGLE.

3. **RIGHT-ANGLED TRIANGLE:**
Triangleni angle ge·sa right angle ge·sa ong·ode indakgipa trianglekon Right-angled Triangle ine minga.



RIGHT-ANGLED TRIANGLE.

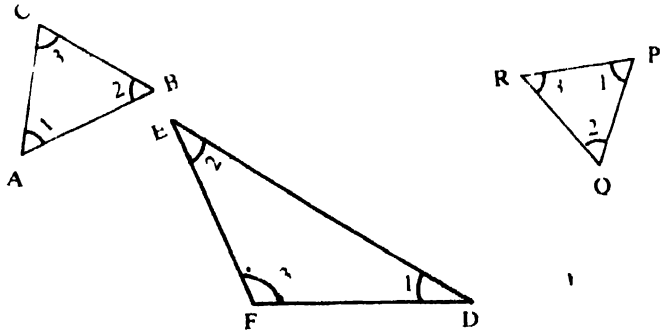
4. **EQUIANGULAR TRIANGLE:**

Triangle ge·sani pilak anglerangan ge·sa gegip-in baksa apsan ong·ode indakgipa trianglekon Equiangular Triangle ine minga.

EQUI-ANGULAR TRIANGLE.

NB: Dingtang dingtang triangleni modelrangko songbad gitcham ba card boardko rate bi'sarangna mesokna man·a. Una agreba gol'srirangko jakkaleba dingtang dingtang triangleni modelrangko mesokna man·a.lan bi'sarangna chong·motgipa ma·sianiko on·na dakchakgen aro an'tangtangan uarangko jaktangchi dake ninaba cholko man·gen.

Triangle ge·sani anglerang badita ong·a? An·ching ka·mao mesokgipa triangle ge·prakni angle rangko toe niode indake nikna man·gen.

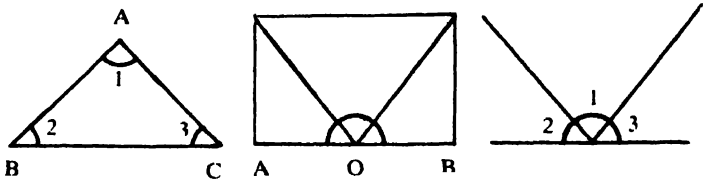


		∠1	∠2	∠3	∠1 +∠2 +∠3
1	ABC	40°	50°	90°	40°+ 50°+ 90° = 180
2	DEF	30°	120°	30°	30 +120°+ 30°= 180°
3	POR	50°	60°	70°	50 +60°+ 70° = 180°

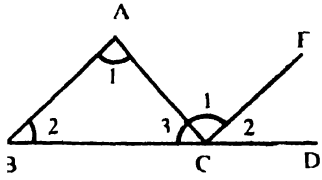
Kosako mesokgipa trianglerangko nie triangle ge·prakni anglerangko ra·dime gimik 180° ba Right angle ge·gni ong·a ine uina man·a.

An ching iani bidingo minggipinko dake niang-kuna man·a.

Lekkako rate triangle ge·sani modelko taribo. Triangle ge·sani anglerangko ka·mao mesoka gita triangleko tem·e uni vertexrangko point ge·sao grong-grikatbo. Indake triangleko tem·on OA aro OB side - rang apsan striaght line one a gita nikgen. Da o /AOB ko straight angle ine minga.Straight angle ge·sao 180° ba Right angle ge·gni donga. Jekai,



Triangle ge·sani angle ge·gitamko chandimode 180° ba Rightangle ge·gni ong·a ine mesokani.



Kosako mesokgipa noksao, ABC triangle ge·sako salaha.Side BC ko Vertex C oni D pointona bariatbo-.Da·o ∠DCE ko∠ 2 baksa apsan ong·e salbo.∠ 1 aro ∠ECA ko toe nion uarang apsan ong·a ine nikgen Unigimin, ∠1+∠2+∠3 =∠BAC+∠ABC+∠BCA=∠ACB+ ∠ACE+ ∠ECB= 180°.

EXERCISE-VIII

1. Ka·mao mesokgipa triangle ge·prakko nie mai triangle ong·a aganbo.

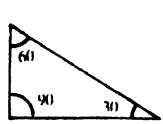


Fig-1

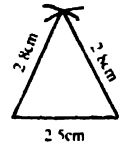


Fig-2

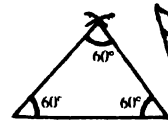


Fig-3

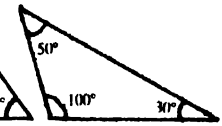


Fig-4

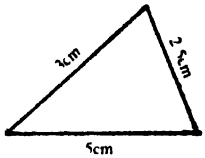


Fig-5

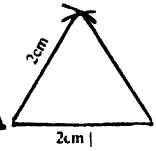


Fig-6

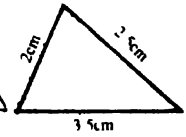


Fig-7

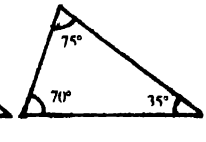
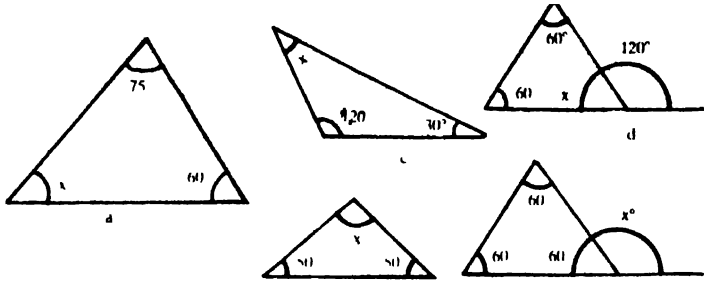


Fig-8

2. Ka·mao mesokgipa on·sogimin ro·aniko jakkale mai mai trianglerangko rikna man·a noksa sale mesokbo.

(a)	3cm	3.5cm	4cm.
(b)	4cm	4cm	4cm.
(c)	4cm	4cm	3cm.
(d)	4.5cm	3cm	4.5cm.

3. Ka·mao mesokgipa trianglerangoniko ∠X ko bikotbo



Ka·e mesokani· Triangle ge·sani angle ge·gni 50° aro 75° ong·ode bangki angleko bikotbo.
50°+75°=125 . ∴ Bangki angle=180°–125°=55°Ans.

4. Isosceles triangle ni apsan ong·gipa anglerangoni ge·sa 70° ong·ode bangki angle ge·gniko bikotbo.
5. Equilateral triangleni angle ge·prak badita ong·na nanga aganbo.
6. Ka·mao mesokgipa triangleni ∠X,∠Y aro ∠Z ko bikotbo.

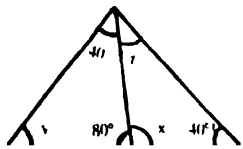


Fig-I

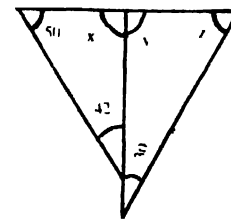


Fig-II

CHAPTER-IX
TRIANGLE ARO PERPENDICULAR LINEKO NOK-SA SALANI

1. SCALENE TRIANGLE:

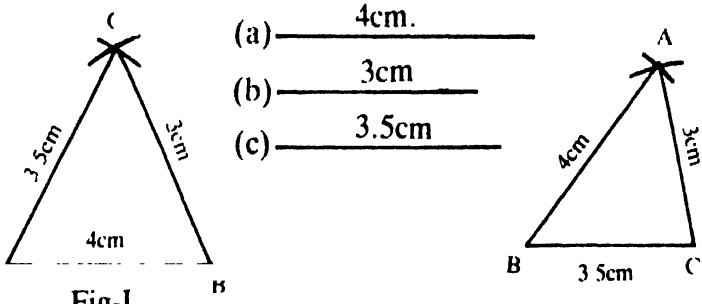


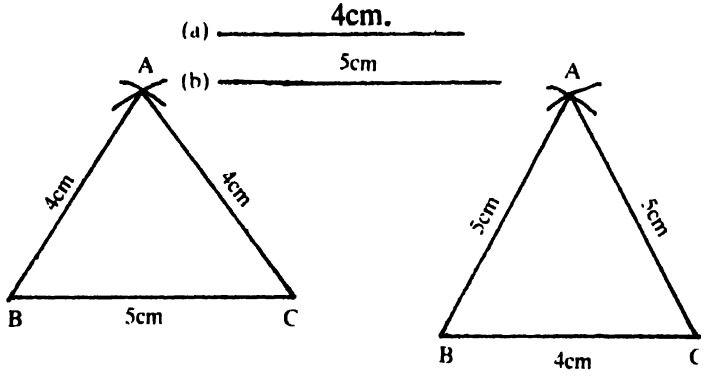
Fig-I

SALANI NIAM:

1. On·gimin linerangoni ge·sako salchengbo.Jekai AB side (4Cm).
2. A pointko centre ra·e aro radius ko 3.5Cm.ra·e arc ge·sako salbo.
3. B pointko centre ra·e aro radiusko 3Cm. ra·e skang salchenggipa arcko ge·gipin arcchi C pointo sal-tongbo.
4. AC aro BC ko linechi nangrimatbo.

Da·o ABC on·sogimino pangchake salgimin triangle ge·sa ong·aha. AB=4Cm.; AC=3.5Cm., BC=3Cm.

2. ISOSCELES TRIANGLE:



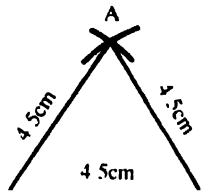
SALANI NIAM:

1. On·sogimin line ge·gnioni jekoba salchengbo.
2. B ko centre ra·e aro radiusko 4cm.ra·e arc ge·sako salbo.
3. C ko centre ra·e aro radiusko 4cm. ra·kue skang salchenggipa arcko ge·gipin arcchi A pointo saltongbo.
4. A,B aro A,C pointrangko linerangchi nangrimatbo.

ABC Isosceles triangle ge·sa ong·aha.
AB=AC=4cm.; BC=5cm.

NB: Kosako Isosceles triangleko rokomgni dake sàle mesokaha.
Skanggipao 5cm.Ko triangleni base ra·aha.gnigipa noksao on·gimin siderangoni 4cm.ko triangleni base dake ra·skaaha.

EQUILATERAL TRIANGLE :



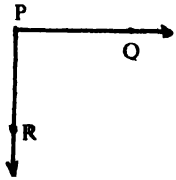
(a) 4.5cm.

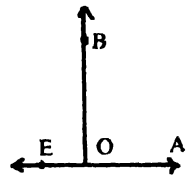
SALANI NIAM :

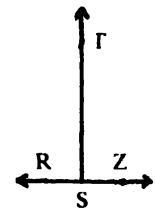
1. On·sogimin sideko salchengbo.Jekai, BC side.
2. B ko centre ra·e aro radiusko BC ni ro·ako ra·e arc ge·sako. salbo.
3. C ko centre ra·e apsan radiuskon ra·kue skang salchenggipa arcko ge·gipin arc-chi. A pointo saltongbo.
4. A,B aro A,C pointrangko linerangchi nangrimatbo. ABC Equilateral ge·sa ong·aha.

AB=AC=BC=4.5Cm.

PERPENDICULAR LINE.







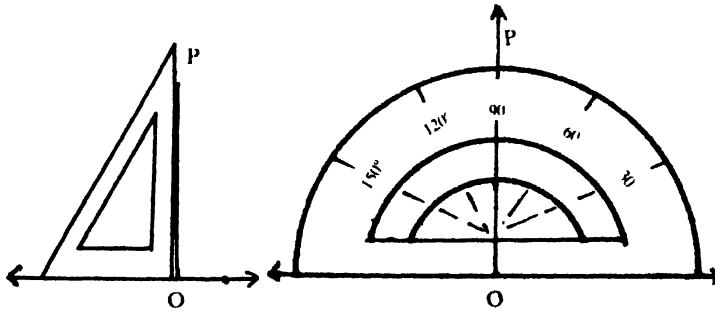
Kosako mesokgipa noksa ge·gitamo perpendicular linerangko mesoka. Skanggipa noksao (Fig.1) PR line aro PQ line right angle ge·sako ong·ata.

Gnigipa noksao (Fig.2) OA line aro OB line right angle ge·sako ong·ata.

Gitamgipa noksao (Fig.3) SZ line aro ST line right angle ge·sako ong·ata.

Jensalo line ge·gni ba side ge·gni right angle ge·sako ong·ata, unon ua line ge·gniko ge·sa ge·gipinna perpendicular ong·a ine agana.

SET SQUARE ARO PROTRACTORKO JAKKALE PERPENDICULAR LINERANGKO SALE MESOK-ANI.



Perpendicular linerangko mesokna " ⊥ " chinko jakkala.Jekai, OA OB. Ian OA side OB side perpendicular ong·a. ine miksonga.

EXERCISE-IX.

1. Ka·mao on·gimin siderangko ra·e trianglerangko salbo aro, salgimin trianglerang mai trianglerang ong·a aganbo.

(a) 5Cm. ; 4Cm. ; 3Cm.
(b) 2.5Cm. ; 3.9Cm. ; 4.5Cm.
(c) 4Cm. ; 4Cm. ; 4Cm.
(d) 3Cm. ; 3Cm. ; 3Cm.
(e) 3Cm. ; 3Cm. ; 5Cm.

(a) 5Cm. ; 4Cm. ; 3Cm.
(b) 2.5Cm. ; 3.9Cm. ; 4.2Cm.
(c) 4Cm. ; 4Cm. ; 6Cm.
(d) 3Cm. ; 3Cm. ; 2Cm.

2. Ka'mao mesokgipa noksarangoniko perpendicular linerangko mesokbo.

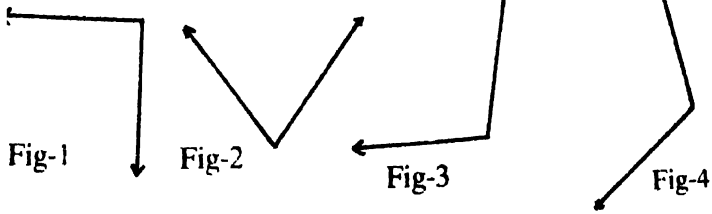
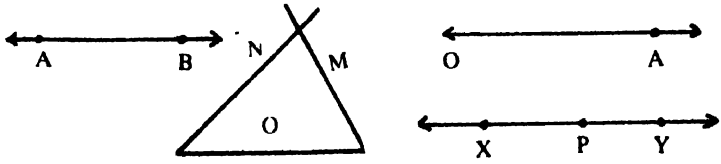


Fig-1 Fig-2 Fig-3 Fig-4

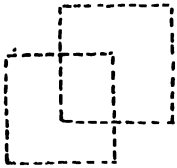
3. Jakrachi mesokgipa noksao A ro B pointrang gita perpendicular line ge'gniko sale mesokbo.
4. Jakrachi salgipa noksao O pointoni M, N aro L linerangona perpendicular linerangko sale mesokbo.
5. Jakrachi mesokgipa OA lineo O pointoni set-squareko jakkale perpendicular line ge'sako sale mesokbo.
6. Jakrachi mesokgipa XY lineo P pointoni protractor-ko jakkale perpendicular line ge'sako sale mesokbo.



CHAPTER-X.

DOTGIMIKGIPA BIMANGRANGKO (Solid geometrical figures) **NOKSA SALE MESOKANI.**

CUBE.



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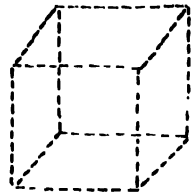

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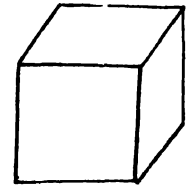
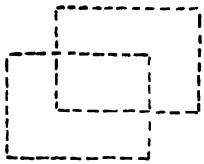


STEP-3.

CUBOID.



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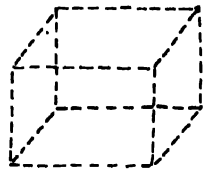
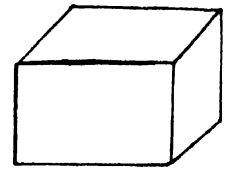


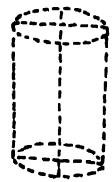
STEP-2.



STEP-3.

CYLINDER.

STEP-1.



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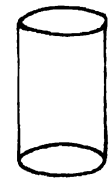
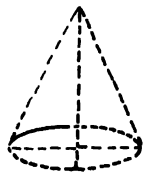


STEP-3.

CONE

STEP-1.



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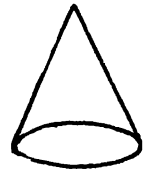
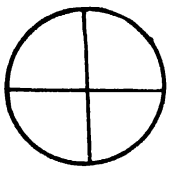


STEP-3.

CIRCLEKO JAKKALE NOKSA SALE MESOKANI.



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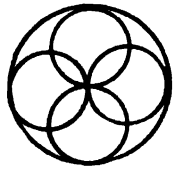
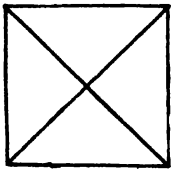


STEP-2.

STEP-3.



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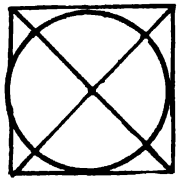

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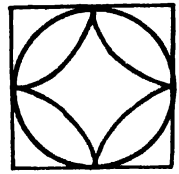

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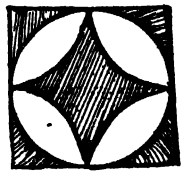

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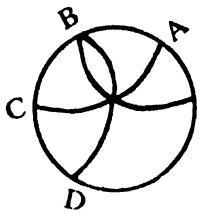
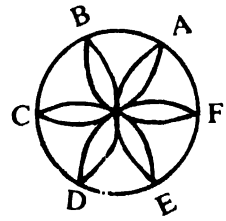


STEP-1.



STEP-2.

STEP-3.

EXERCISE-X.

1. Ka·mao janapgimin square ni siderango pangchake Cube-ni noksako sale mesokbo.
   (i) 3.5cm. (ii) 4Cm. (iii) 5cm. (iv) 4.5cm.
2. Ka·mao janapgipa rectangleni gro aro gipengko ra·e Cuboidni noksako sale mesokbo.
   (i) Gro-4cm. ; Gipeng-2.5cm.
   (ii) Gro-5cm. ; Gipeng-4cm.
   (iii) Gro-4.5cm. ; Gipeng-3cm.
3. Ka·mao Cylinderni chuani aro baseni ro·aniko ra·e Cylinderni noksako sale mesokbo.
   (i) Chuani-5cm ; Base-2.6cm.
   (ii) Chuani-6cm ; base-4.8cm.
4. Ka·mao janapgipa Cone-ni chuani aro base-ni ro·ako ra·e cone-ni bimangko noksa sale mesokbo.
   (i) Chuani-4cm ; base-2cm.
   (ii) Chuani-5cm ; base-4cm.
5. Ka·mao janapgipa Circleni radiusko ra·e Circleni dingtang dingtang bimangko noksa sale mesokbo.
   (i) 2.5cm. (ii) 3cm. (iii) 4cm. (iv) 3.6cm.

ANSWERS.
EXERCISE-I.

1. Chi ringani mug-Cylinder ; Robol-Sphere ; Bakos-Cuboid.
   Chochokki-Cone ; Wa·tok-Cylinder ; Dislai bikop-Cuboid.
   Bol bite-Sphere ; Mula-Cone ; Kerosene-tin-Cuboid ; Kitap-Cuboid Pencil ku·chot-Cone. Krong-Cylinder.

EXERCISE-II.

3. Fig.I-Plane surface ; Fig.II-Plane ong·ja ; Fig.III-Plane ong·ja ; Fig.IV-Plane ong·ja ; Fig.V-Plane ong·ja ; Fig.VI-Plane ong·a ; Fig.VII-Plane ong·a ; Fig.VIII-Plane ong·ja.

EXERCISE-IV.

1. Fig.I & Fig.IV-Rectangle.
2. Fig.I & Fig.III-Square.
6. Fig.I-Triangle ge 4. Fig.II-Triangle ge 6.

EXERCISE-V.

1. Fig.I-Triangle ; Fig.II-Rectangle ; Fig.III-Square.
2. Bang·en salangkuna man·gen.
3. Line ge·san salna man·a.
4. Line ge·gittam.
5. Line ge 4.

EXERCISE-VI.

2. (i) Q-vertex ; PQ & RQ. (ii)R-vertex ; PQ & RQ. (iii) P-vertex ; PQ & PR. (iv)R-vertex ; PR & PQ.
3. P aro Q ning·o ; H & F·a·palo aro C & D tiktak melia.
4. POQ, POR, POS & POT.

EXERCISE-VII.

1. Fig.I-Acute angle ; Fig.II-Right angle ; Fig.III-Obtuse angle ; Fig.IV-Acute angle.
2. (a) ∠AOB ; ∠BOC ; ∠COD aro ∠DOE ge·prakan acute angle ong·a.
   (b) ∠AOD ; ∠E0B ge·prakan Obtuse angle ong a.
   (c) ∠AOC ; ∠COE ge·prakan rt·angle ong·a.
   (d) (i) ∠AOB+∠COB ; ∠COD+∠COE complementary anglerang ong·a.
   (ii) ∠AOB+∠BOE ; ∠DOE+∠DOA Supplementary anglerang ong·a.
3. (i) 55° (ii) 35° (iii) 71° (iv) 20° (v) 45° (vi) 3°
4. (i) 125° (ii) 60° (iii) 80° (iv) 105° (v) 135°
6. (i) 22½° (ii) 40° (iii) 9° (iv) 63°
7. 60°

EXERCISE-VIII.

1. Fig.I-Rt·angled triangle ; Fig.II-Isosceles triangle. Fig.III-Equiangular triangle ; Fig.IV-Obtuse angled trinagle ; Fig.V-Scalene triangle ;

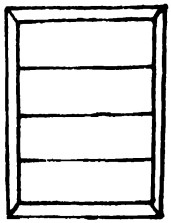
Fig.VI-Equilateral triangle ; Fig.VII-Scalene triangle ; Fig VIII-Acute angled triangle.

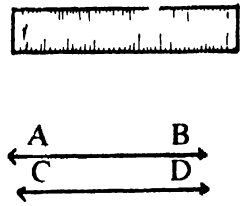
3. (a) $\angle X = 45°$ (b) $\angle X = 80°$ (c) $\angle X = 30°$ (d) $\angle X = 60°$ (e) $\angle X = 120°$
4. 70° aro 40°
5. Angle ge'prak 60°
6. Fig.I ($\angle Y = 60°$; $\angle X = 100°$; $\angle Z = 40°$)
   Fig.II ($\angle X = 88°$; $\angle Y = 92°$; $\angle Z = 58°$)

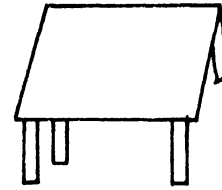
BAK-II

BAK-I.
PARALLEL LINERANG.

An ching an· chingni samtangtango bang·bea parallel linerangni bimangrangko nikna man·a.Jekai. Scaleni riking samgnian parallel linerang ong a.Una agreba, kelki ba do gani mikkangchakgrikgipa sambeng- rang (chong·motan siderang) parallel linerangko mesoka. Ka·mao parallel linerangni bimangrangko mesoka.

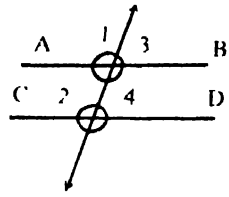






Kosako mesokgipa noksarango, kelkini go olrang, scaleni rikingrang aro Tableni ja·chokrang parallel linerang ong·a.Kosako mesokgipa noksao AB aro CD linerang parallel linerang ong·a.Parallel linerang pangnaba ge·sa ge·gipinko gronggrikja.Parallel lineko mesokna "||" chinko jakkala. Jekai, "AB|| CD" Iani miksongani AB aro CD linerang parallel ong·a ine mesoka.

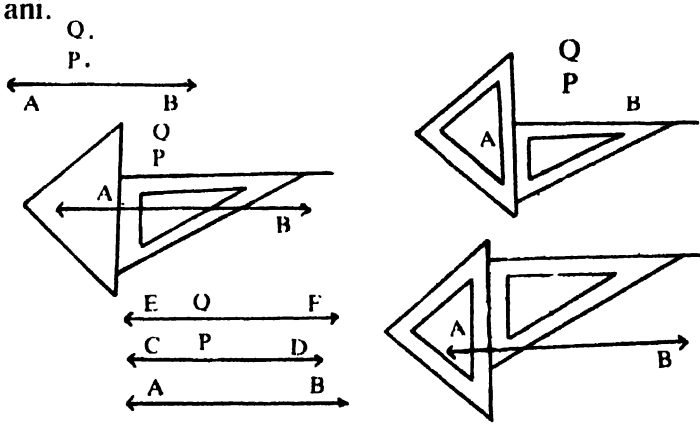
Parallel linerangni sakkirang.



Kosako mesokgipa noksao AB aro CD parallel linerang ong·a. Ua line ge·gniko ge·gipin EF linechi P aro Q pointrango saltongaha. Protractorko jakkale uarangni anglerangko toe nion indake nikna man· a. ∠1=∠2; ∠5=∠7; ∠3=∠4; ∠6=∠8; ∠5=∠4; ∠6=∠2. Ia janapgipa anglerangoni jorasa mangmang apsan ong·aioba linerang parallel ong·a ine aganna man·aia.

Parallel linerangko noksa salani niamrang.

1.Set Squareko jakkale parallel linerangko sale mesokani.

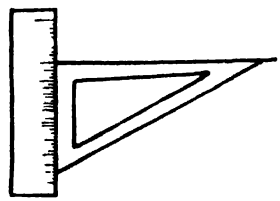


Talatani.

1. AB line ge·sako salchengbo. Uni kosako P aro Q pointrangko donbo, je pointrang gitan linerangko AB na parallel ong·a salna nanggen.
2. Kosako mesoka gita (Fig2) set squareni triangle ge sani rikingko AB line baksa chapchap meliatbo. Ge·gipin triangleko jakasichipak done uni rikingko jakrachini riking baksa nangchape donbo.
3. Jakasichini triangleko illengatgija kim·kim rim:e jakrachini triangleko P pointona kosakchi sikdoatbo. (Feg3)P point gita triangleni riking joljol CK lineko salbo.
4. Jakasichini triangleko illengatgija kim·kim·rim·kue jakrachini triangleko Q pointona ka sine sikdoatbo. Set Squareni rikingjoljol Q point gita EF lineko salbo.

Salgimin parallel line ge:gittamko Fig3 oniko nikna man·a.

Parallel linerangko noksa salanio jakasichini triangleni pal scaleko jakkaleba salna man·a·Jekai,

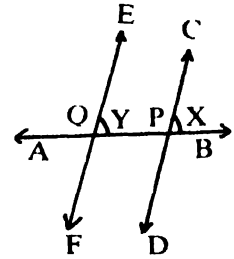


2. Protractorko jakkale parallel linerangko noksa salani

(1) AB aro CD linerangko P pointo battonggrike salchengbo.

(2) Protractorko jakkale ∠X ko tobo.

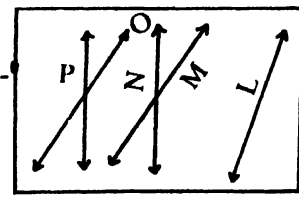
(3) AB lineo Q pointko ra·e uno ∠Y ko ∠X baksa apsan ong·e EF linechi saltongbo.



CD aro EF parallel linerang ong·a ine nikna man·a. Noksako ka·mao mesoka.

EXERCISE—I

1. Jakrachi mesokgipa noksaoniko nie parallel ong gipa linerangko mingbo.



2. Jakrachi mesokgipa noksarango parallel linerangko mesoka. Uarangoniko ∠X ko bikotbo.

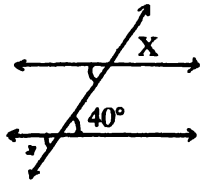


Fig-1

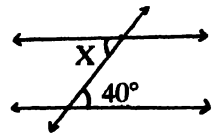


Fig-2

·3 Ka mao mesokgipa noksarangoniko nie badiagipa noksa parallel linerangko mesoka mesokbo

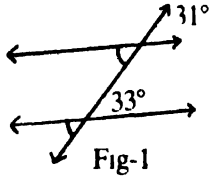


Fig-1

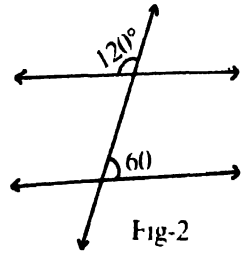


Fig-2

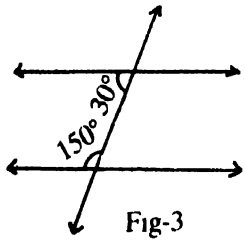


Fig-3

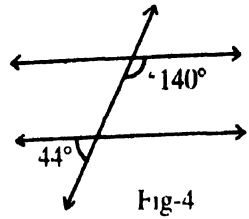
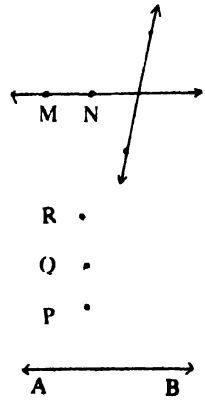


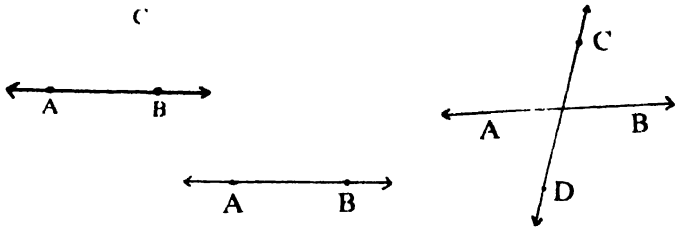
Fig-4

4. Jakrachi mesokgipa noksao PQ linena on·sogimin M aro N pointranggita protractorko jakkale parallel linerangko sale mesokbo. (Iano je anglekoba skatang ra e salna man·a)



5. Set Squareni triangle ge·sa aro scaleko ra e. on sogimin AB linena P,Q aro R pointrang gita parallel linerangko sale mesokbo.

6. Ka·mao salgimin noksarango Protractor aro scaleko ra·e. AB linena C point gita parallel line ge·sako sale mesokbo.

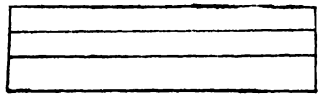


Bak—2.

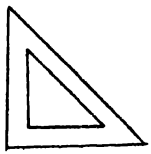
GEOMETRY NI NOKSARANGKO SALE MESOK ANIRANG.

An· ching mathematical box ba Instrument box-oniko niode uano adita bosturangko nikna inan·gen-.Jekai.

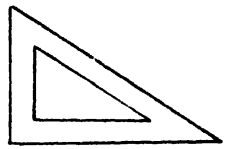
1. SCALE .BA RULER.



2. SET SQUARES

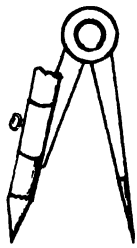


Isosceles rt·angled triangle

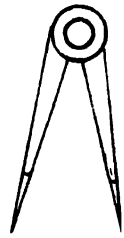


Rt·angled triangle.

3. COMPASS ARO DIVIDER

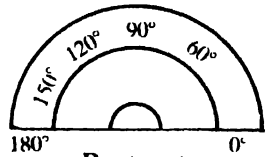


Pencil Compass



Divider

PROTRACTOR



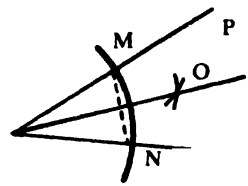
Protractor

Kosako janapgimin ostrorang gri an·ching Geometry ko skie ra·na· man·ja.Iandakgipa ostrorang-ko jakkalachisan geometryni noksarangko tiktak ong·e salna man·aia.

PROBLEM—I

On·sogimin Angle ge·sako apsangrik bakgni dake sualani.

(To bisect a given Angle).



∠PQR on·sogimin angle ge·sa ong·a aro uko apsan bakgni dake sualna nangani.

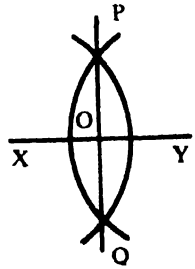
Rikani Niam :

1. Q ko centre ra·e. aro radiusko skatang ra·e. ∠POQ ko PQ aro QR siderangko M aro N pointrango arc ge·sachi saltongbo.
2. M ko centre ra·e aro MN ko radius ra·e. arc ge·sako salbo
3. N ko centre ra·e aro MN ko radius ra·e skang salchenggipa arcko gipin arcchi O pointo saltongbo.
4. O\ aro Q pointrangko nangrimatbo.

Da·o OQ line ∠POQ ko apsan bakgni dake sualaha.
∴ ∠PQO=∠RQO.

PROBLEM—2

On·sogimin st·line ge·sako apsangrik bakgni dake sualani. XY on·sogimin st·line ge·sa ong·a aro uko apsangrik bakgni dake sualna nangani.



RIKANI NIAM :

1. X ko centre ra·e aro radiusko XYni ro·ani adhana bate ro·e ra·e arc ge·sachi XY ko saltongbo.
2. Yko centre ra·e radiusko apsan skanggitan ra·kue skang salchenggipa arcko ge·gipin arcchi P aro Q pointrango saltongbo.
3. P aro Q pointrangko nangrimatbo.

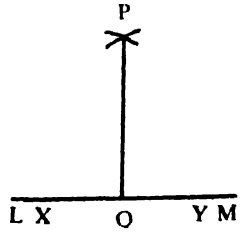
Da·o PQ XY st·lineka O pointo apsangrik bakgni dakaha.

$\therefore OX = OY.$

PROBLEM—3.

On·gimin st·line ge·sani ning·o on·sogimin point gita una perpendicular ge·sako salani.

LM st·line ge·sao O pointko on·soaha.Da·o O point gita LM linena perpendicular ge·sako salna nangani.



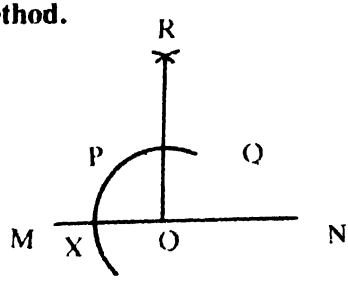
RIKANI NIAM

1. O ko centre ra·e aro radiusko skatang ra·e LM·st·lineko X aro Y pointrango arc ge·gnichi saltongbo.

2. X ko centre ra·e aro XY ko radius ra·e arc ge·sako salbo.
3. Y ko centre ra·e aro XYkon radius ra·kue ge·gipin arcchi P pointo saltongbo. Da·o P aro O pointrang-ko nangrimatbo.

Da·o PO LM st·linena perpendicular ong·aha.
$\therefore \angle POX = \angle POY = 90^\circ$

Gnigipa Method.



RIKANI NIAM :

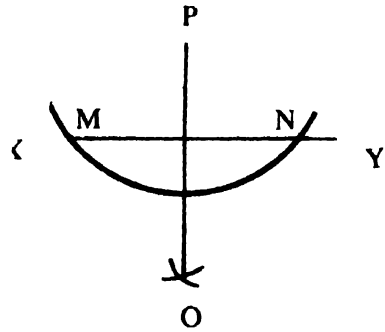
1. O ko centre ra·e aro radiusko skatang ra·e arc ge·sako MN·stlineko X pointo saltongbo.
2. X ko centre ra·e aro radiusko skang gitan apsan ra·kue salchenggipa arcko ge·gipin arc chi P pointo saltongbo.
3. P ko centre ra·e aro radiusko skanggitan apsan ra·taie salgimin arcko ge·gipin arcchi Q pointo saltongbo.
4. P aro Q ko centre ra·e aro PQ ko radius ra·e arc ge·gniko R pointo saltonggrikbo.
5. Oaro R ko nangrimatbo.

Da·o RO MN st·linena perpendicular ong·aha.
$\therefore \angle XOR = \angle RON = 90°$

PROBLEM—4.

On·gimin st·lineona uni a·palo on·gimin pointoni perpendicular lineko salani.

XY on·gimin st·line ge·sa,aro P point uni a·palo on·gimin point ong·a.Da·o O pointoni XY st·lineona perpendicular lineko sale mesokani.



RIKANI NIAM :

1. P ko centre ra·e aro radiusko adita ro·e ra·e XY st·lineko M aro N pointrango arc ge·sachi saltongbo.
2. M aro N ko centre ra·e aro MN ko radius ra·e P ni ka·machipak arc ge·gniko O pointo saltonggrikbo.
3. Oaro P ko nangrimatbo.

Da·o PO,SY·st·linena perpendicular ong·aha.
$\therefore \angle PRM = \angle PRN = 90°$

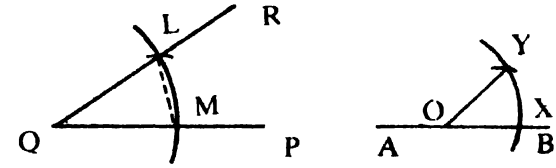
EXERCISE—2.

1. Angle 45° ko noksa sale, uko apsangrik bakgni dake sualbo. (bisect), aro sualgimin bakprakni degreeko hisab ka·e mesokbo.
2. Angle 120° ko Protractorchi sale uko apsangrik bakgni dakbo. Sualgimin bakprakni angle badita degree ong·a hisab ka·e mesokbo.
3. 5cm. ro·gipa st·line ge·sako sale uko apsangrik bakgni dakbo. Sualgimin bakprakni ro·aniko hisab ka·bo.
4. 6.2cm. ro·gipa st·line ge·sako sale uko apsangrik bakgni dakbo. Sualgimin bakprakni ro·a badita hisab ka·bo.
5. XY st:line ge·sao O point gesako ra·bo.Da·o O pointoni XY st·linena perpendicular line ge·sako salbo.
6. LM·st·lineni a·palo Q point ge·sako on·soaha.Da·o on·gimin Q pointoni ·LM·st·linena perpendicular line ge·sako sale mesokbo.
7. 9cm. ro·gipa st·line ge sako sale unoni a·paloni e'5cm.chel'e on·gimin st·linena perpendicular ge·sako salbo.
8. 8cm. ro·gipa st·line AB ko salbo.A aro B oni 2.5.cm. chel·grike AB· st·lineo P aro Q pointrangko donbo.Da·o. P aro Q pointrang gita AB st·linena perpendicular line ge·gniko salbo. Salgimin perpendicular linerang ge·sa ge·gipinna parallel ong ama ong·ja aganbo.

PROBLEM—5.

On·gimin st·line ge·sani ning·o on·gimin point ge·saoni janapgimin angle· ge·sako salani.

∠PQR on·sogimin angle ge·sa ong·a, aro AB on·gimin st·line ge·sa ong·a. Da·o AB st·lineo O point ge·sako ra·e angle ge·sako on gimin ∠POQ baksa apsan ong·e salna nanga.



RIKANI NIAM :

1. Q ko centre ra·e aro radiusko skatang ra·e, QR aro PQ siderangko arc ge·sachi L aro M pointrango saltongbo.
2. O ko centre ra·e aro apsan radiuskon ra·kue AB·st·lineko arc ge·sachi X pointo saltongbo.
3. X ko centre ra·e aro LM ko radius ra·e skang salchenggipa arcko ge·gipin arcchi Y pointo saltongbo.
4. OY ko nangrimatbo.

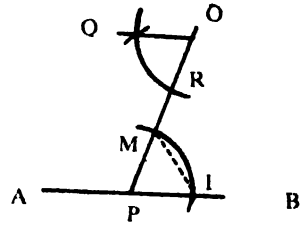
Da·o ∠XOY rikgimin angle ge·sa ong·aha.

$\therefore$ ∠XOY=∠PQR.

PROBLEM—6

On·sogimin st·line ge·sana on·sogimin point ge·sa gita parallel lineko salani.

AB on·sogimin line ge·sa ong·a aro O on·sogimin point ge·sa ong·a.Da·o O point gita st·line ge·sako AB na parallel ong·e salna nanga.



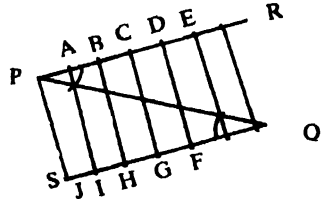
RIKANI NIAM :

1. AB·st·lineo P pointko ra·e OP ko nangrimatbo.
2. P ko centre ra·e aro radiusko skatang ra·e OP aro AB ko M aro L pointrango arc ge·sachi saltongbo.
3. O ko centre ra·e aro radiusko apsan ra·kue OP ko R pointo arc ge·sachi saltongbo.
4. R ko centre ra·e aro ML ko radius ra·e skang salchenggipa arcko ge·gipin arcchi Q pointo saltongbo.
5. OQ ko nangrimatbo.

Da·o OQ,AB na parallel ong'aha.

$\therefore$ OQ AB; $\angle POQ = OQB$.

On·sogimin st·line ge·sako apsangrik adita bakrang dake sualani.



P,Q, on·sogimin st·line ge·sa ong·a aro uko

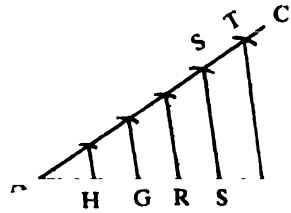
apsangrık bak 5 dake sualna nanga.

RIKANI NIAM :

1. P point gita PR lineko sale PQ baksa angle ge·sako salbo.
2. Q pointo QS ko PR na parallel ong·e salbo.Parallel lineko salna problem 5 ni niamko jakkalbo.
3. PR lineko apsangrik a,b,c,d, aro e pointrango bak 5 dake sualbo.
4. QS lineko apsangrik f,g,h,i aro j pointrango apsangrik bak 5 dake sualbo.
5. Qe,fd,cg,bh,ai aro Pj ia pointrangko nangrimatbo.
6. PQ ko L,M,N,O pointrango apsangrik bak 5 dake sualaha.

$$\therefore PL=LM=MN=NO=OQ.$$

Gnigipa Method.



RIKANI NIAM :

1. A point gita AC lineko adita ro·e sale BAC angle ko ong·atbo.
2. AC lineko apsangrik bak 5 dake P,Q,R,S, aro T pointrango arcranngko sale bak dakbo.
3. TB ko nangrimatbo.
4. TB na parallel ong·e p,h,Qq,Rr,Ss linerangko salbo.

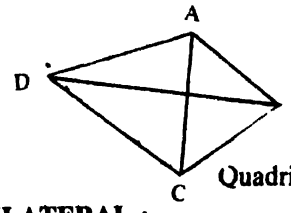
Da:o AB lineko p,q,r,s pointrango apsangrik bak 5 dake sualaha.

$\therefore$ Ap=pq=qr=rs=sB.

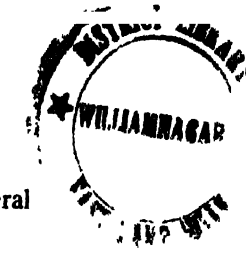
EXERCISE—3.

1. 45° angleko on·soaha.Uko on·gimin line ge·sani on·gimin point gita angleko on·sogimin angle baksa apsan ong·e salbo.
2. 60° angleko protractorchi salbo. Uko on·gimin AB line on·sogimin point P-O angle ge·sako on·gimin angle baksa apsan ong·e salbo.
3. PQ line ge·sa ong·a aro O pointko PQ lineni a·palo on·soaha.Da·o O point gita PQ linena AB lineko parallel ong·e salbo.
4. AB lineni ro·a 8cm. ong·a Uko apsangrik bak 4 dake sualbo. Bakprakni ro·a badita ong·a hisab ka·e nangni salgimin noksa baksa tosusae nibo.

BAK— 3
SIDE GE'BRICHI ONG'ATGIPA BIMANGRANG.
(Quadrilaterals)



Quadrilateral



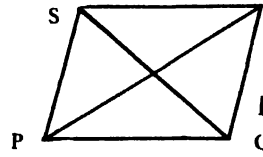
1. QUADRILATERAL :

Side ge·brichi dulgipa je bimangba quadrilateral ong·na·man·a· jekai,

Kosako mesokgipa noksao ABC, quadrilateral bimang ge·sa ong·a AC aro BD linerango jerangan quadrilateral ni mikkanggrikgipa angle ge gniko nang-rimata, ua linerangko diagonal ine minga·jekai kosako mesokgipa noksao AC aro BD linerang diagonalrang ong·a.

2. **PARALLELOGRAM :**

Quadrilater bimangni mikkanggrikgipa siderang parallel ong·ode ua bimangkon Parallelogram ine minga. jekai.

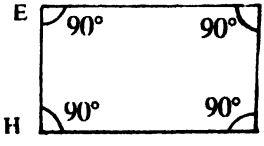


Parrallelogram

Kosako mesokgipa noksao PQRS parallelogram ge·sa ong a. Iano PQ aro QR ia linerang parallel ong·a. Una agreba SR aro PQ linerang ge·sa ge·gipinna parallel ong a.Ia parallel ong·gipa siderang ge sa ge·gipinna apsanba ong·a.jekai, RS=PQ aro RS=QR.Mikkanggrikgipa anglerangba ge·sa ge·gipin baksa aspan ong·a·jekai, ∠PQR=∠PSR aro ∠SPQ=∠SRQ.

3. **RECTANGLE;**

Rectangleba Parallelograman ong·a indiba uni pilak anglerang right angle ba 90° ong·a.Unigimin je parallel-



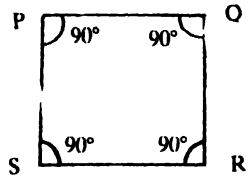
Rectangle

ogramni angle ge·prak right angle ong·a ba 90° ong·a, indakgipa parallelogramko Rectangle ine minga.

Kosako rectangleni noksako mesoka. Iano EFGH rectangle ge·sa ong·a EF=GH; EH=FG. ∠E= ∠F= ∠G= ∠H=90°. Rectangleni deagonalrang ge·sa ge·gipin baksa apsan ong·a.

4. SQUARE :

Ian apsan ong·gipa side ge· brichi dulgipa bimang ge·sa ong·a.Una agreba uni angle ge·prakan right angle ong·a.

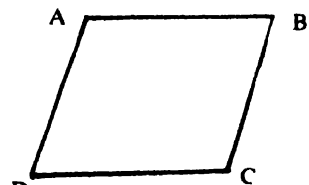


Square

Kosako squareni bimangko mesoka. PQRS square ge·sa ong·a PQ=QR=RS=SP. ∠pP= ∠Q= ∠R= ∠S.=90°. Squareni diagonalrang ge·sa ge·gipin baksa apsan ong·a.

5. RHOMBUS :

Rhombus apsan ong· gipa side ge·brichi dulgipa



Rhombus

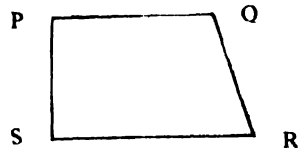
bimang ge·sa ong·a·, ındiba uni anglerang ge·prakan right angle ong·ja.Unigimin Rhombusko siderang

apsan ong·gipa parallelogram ine mingna man·a. Rhombusni mikkanggrikgipa anglerang apsan ong·a.

Kosako Rhombus ni noksako mesoka.
AB=BC=CD=DA.
∠A=∠C; ∠D=∠B.

6. TRAPEZIUM :

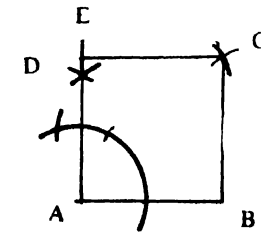
Ian quadrilateral bimang ge·sa ong·a, indiba uni mikkanggrıkgipa side jorasasan parallel ong·aia.Uni pilak side aro anglerang ge·sa ge·gipin baksa apsan ong·ja.



Trapezium

QUADRILATERAL BIMANGRANGKO NOKSA SALANI.
SQUARE.

Squareni side ge·sa 4cm·ko ra·e Squareni bimang-ko sale mesokani.



RIKANI NIAM.

1. AB st·lineko 4cm.ro e salbo.
2. A pointo AB sidena prob-lem 3 ni gnigipa methodko jakkale AE ko perpendi-

cular ong·e salbo.

3. AE ni ro·ako 4cm.ro·e D pointo den·sotbo.
4. D ko centre ra·e aro radiusko 4cm ra·e arc ge·sako salbo.
5. B ko centre ra·e aro radisuko 4cm. ra·kue skang salchenggipa arc-ko c pointo saltongbo.
6. BC aro CD ko nangrimatbo.

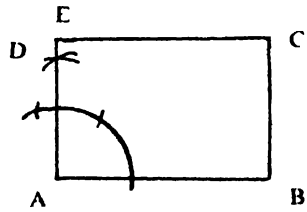
'ABCE square ge·sa ong·aha

$\therefore AB=BC=CD=DA=4cm.$

$\angle A= \angle B= \angle C= \angle D=90°$

RECTANGLE.

Rectangleni side ge·gniko on·soaha. Jekai, 5.2cm aro 3.5cm.. Ia on·gimin siderangko ra·e rectangleni bimangko sale mesokani.



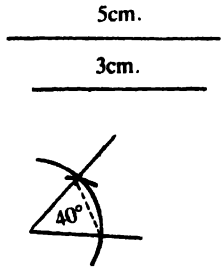
RIKANI NIAM;

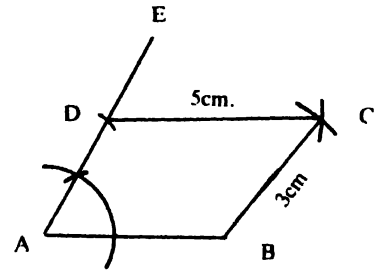
1. AB st·lineko 5.2cm. ong·e salchengbo.
2. A pointo problem 3 ni gnigipa methodko jakkale AB na AE ko perpendicular ong·e salbo.

3. AE ko AD-o 3.5cm. ong·e den·sotbo.
4. D ko centre aro radiusko 5.2cm. ra·e 'arc ge·sako salbo.
5. B ko centre ra·e aro radiusko 3.2cm. ra·e skang salchenggipa arcko c pointo saltongbo.
6. DC aro BC ko nangrimatbo. Da·o ABCE rectangle ge·sa ong·aha. CE=AB=5.2cm; AD=BC=3.5cm. ∠A= ∠B= ∠C= ∠D=90°

PARALLELOGRAM.

On·sogimin adjacent side ge·gni aro angle ge·sako ra·e parallelogramko noksa salani.





RIKANI NIAM :

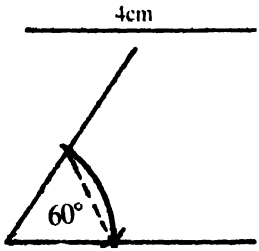
1. AB. st·lineko 5cm. ro·e salbo.
2. A pointo prpblem 4 ni niamko jakkale ∠BAE ko on·gimin angle baksa apsan ong·e salbo.
3. AE ko AD-o 3cm. ro·e den·sotbo.
4. D ko centre ra·e aro radiusko 5cm. ra·e are ge·sako ·salbo.

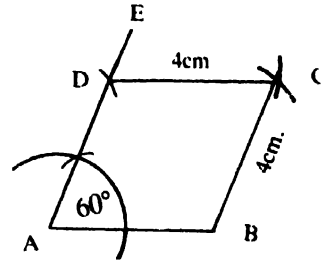
5. B ko centre ra·e aro radiusko 3cm. ra·e skang salchenggipa arc-ko ge·gipin arcchi C pointo saltongbo.
6. BC aro CD ko nangrimatbo.

ABCD parallelogram ge·sa ong·aha.
CE=AB=5cm.; AD=BC=3cm.; ∠A= ∠C=40°

RHOMBUS.

On·sogimin side ge·sa aro angle ge·sako ra·e rhombus ko noksa salani.





RIKANI NIAM :

1. AB st·lineko 4cm. ro·e salbo.
2. A pointo ∠BAE ko on·sogimin angle baksa apsan ong·e salbo. AD ko 4cm. ro·e salbo.
3. D ko centre ra·e aro radiusko 4cm. ra·e arc ge·sako salbo.
4. B ko centre ra·e aro apsan radiuskon ra·kue skang salchenggipa arc-ko C pointo saltongbo.
5. CD aro BC ko nangrimatbo.

Da·o ABCE Rhombus ge·sa ong·aha.
AB=BC=CE=DA=4cm; ∠BAD=60°

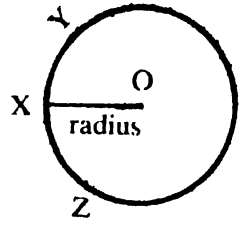
EXERCISE-4.

1. Parallelogram mai dakgipa bimang ong a talatbo.
2. Rectangle maidakgipa bimang ong·a talatbo.
   Rectangle aro parallelogram maio dingtanggrika talatbo.
3. Rhombus aro square maio dingtanggrika talatbo.
4. Rectangleko noksa salbo:—
   (i) 5cm, 4.5cm, (ii) 6cm, 5.5cm.
   Salgimin rectanglerangni diagonalrangko toe uarang apsan ong·ama ong·ja aganbo.
5. Parallelogramko noksa salbo:—
   (i) 6.5cm, 5cm. ∠45°
   (ii) 7.5cm, 6.5cm. ∠60°
6. Squareko noksa salbo:—
   (i) 4.5cm. (ii) 3cm. (iii) 5cm.
   Salgimin squarerangni diagonalrang apsan ong·a-ma ong·ja toe nie aganbo.
7. Rhombusko·noksa salbo:—
   (i) 4.5cm. ∠70°. (ii) 5.4cm. ∠65°
   Rhombusni diagonalrangni batsotgrikgipa angleko toe badita ong·a aganbo.

BAK—4.
C I R C L E.

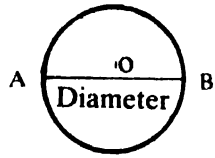
An· chingni porabagimin gita circleni bimanga garichaka ba jaksan ni bimang gita dakanga. Jekai,

Kosako Circleni bimangko mesoka. O pointko circleni centre (ba bijatchigipa point) aro OX lineko radius ine minga. Saldulgipa lineko circumference ine minga, jekai, XYZ.



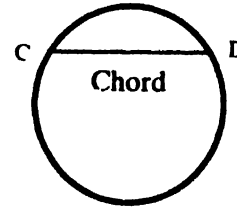
Diameter:

Circumferenceni point ge·gniko circleni centre gita batsote nangrimatgipa linekon Diameter minga. Jekai,



Chord:

Circleni circumference ni je point ge·gniko nangrimatgipa linekon Chord ine minga. Jekai, Jakrachi mesokgipa noksao CD circleni chord ge· sa ong·a-.Diameteran circleni dal·batgipa chord ong·a ine nikna man·a.



Semi-Circle:
Circleko diameterkosale bakgni dake sualna man·a. Sualgimin circleni bakprakkon semi-circle ine minga. Semi-ni orto adha, unigimin semi-circleni orto circleni adha ong·a. Jekai,

Semi-Circle

EXERCISE-5.

1. Ka·mao janapgipa radiusrangko ra·e circleko salbo.
   (a) 3cm. (b) 4.5cm. (c) 2.5cm.
2. Ka·mao janapgipa diameterni ro·aniko ra·e circleko salbo.
   (a) 5cm. (b) 6cm. (c) 8.4cm.
   (Hints. Circleko salna skang radiusni ro·ako hisab ka·chengbo).
3. Ka·mao sing·anirangna aganchakbo:—
   (a) Circle ge·sani pilak radiusrangan apsan ong·ama?
   (b) Circleni chord radius ong·na man·ama?
   (c) Circleni diameter radiusna badita chang ro·b ata?
   (d) Circle ge·sao centre ge·gni dongna man·ama?
4. Ka·mao janapgipa radiusrangko ra·e circleni diameterko noksa salbo.
   (a) 2.5cm. (b) 3cm. (c) 3.5cm.

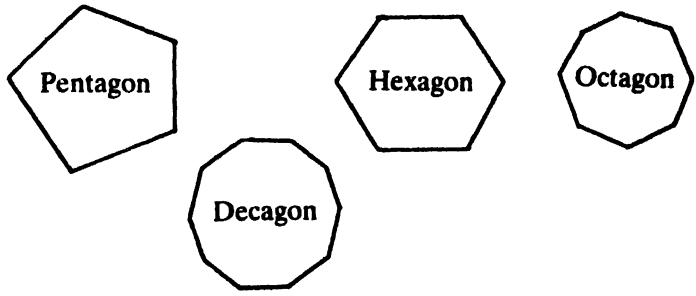
5. Ka·mao sing·anirangna aganchakbo:—
   (a) Circle ge·sani diameter 8cm. ong·ode radiusni ro·a badita?
   (b) Circle ge·sani radius 2.5cm. ong·ode apsan circleni radiusni ro·a badita?
   (c) Circleni ro·batgipa chordko mai ming·a?

BAK—5.
P O L Y G O N.

Bang·a st·linerangchi duulgipa bimang ba plane figure-kon Polygon ine minga.
Side ge·gitamchi duulgipa polygonko Triangle ine minga.
Side ge brichi dulgipa polygonko Quadrilater ine minga.

Polygonko uarangni siderangni kri bimangrangko dona. Jekai,

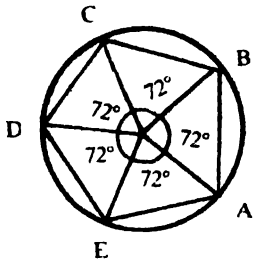
1. PENTAGON: Side ge·bongachi duulgipa bimang.
2. HEXAGON: Side ge·dokchi duulgipa bimang
3. HEPTAGON: Side ge·snichi duulgipa bimang

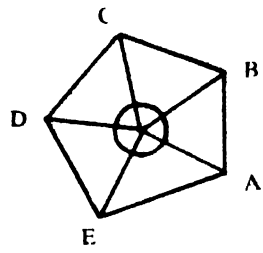


4. OCTAGON: Side ge·chetchi duulgipa bimang
5. DECAGON: Side ge·chikingchi duulgipa bimang

POLYGONRANGKO NOKSA SALE MESOKANI.

REGULAR PENTAGON.





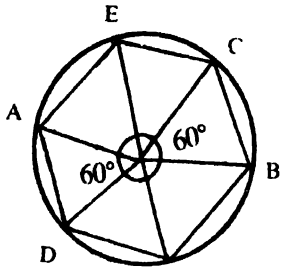
PENTAGON

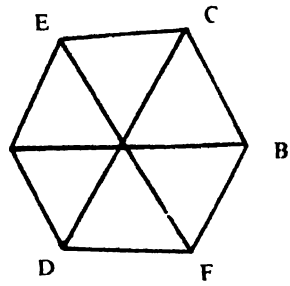
RIKANI NIAM:

1. Radiusko skatang ra·e circle ge·sako salchengbo.
2. OA radius ge sako salbo.
3. Jatchini angleko bakbonga dake sualbo. (360°÷5=72°)
4. OA radiusna 72° chel·grike OB, Oc, OD aro OE radiusrangko salbo.
5. AB, BC, CD, DE ko nangrimatbo.
6. Circleni circumferenceko kimite galbo.

ABCDE pentagon ge·sa ong·aha.
AB±BC=CE−DE=EA.; ∠A=∠B=∠C=∠D=∠E=72°.

REGULAR HEXAGON.



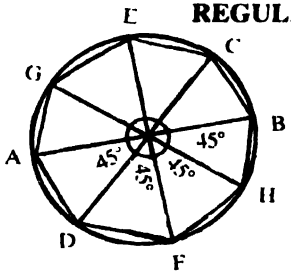


HEXAGON

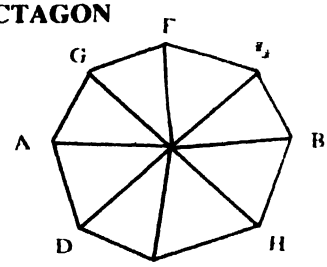
RIKANI NIAM.

1. Radiusko skatang ra·e circle ge·sako salchengbo.
2. AB diameterko salbo.
3. Jatchini angleko bak 6 dake sualbo. (360°÷6=60°).
4. Diameter ge·prakko 60° chel·grike CD aro EF diameterrangko salbo.
5. BC, CE, EA, AD aro DF ko nangrimatbo.
6. Circumferenceko kimite galbo.
7. BCEADF, Hexagon ge·sa ong·aha.

BC=EC=EA=AD=DF;
∠A= ∠D= ∠F= ∠B= ∠C= ∠E= ∠A.=60°



REGULAR OCTAGON



OCTAGON

RIKANI NIAM:

1. Radiusko skatang ra·e circle ge·sako salchengbo.
2. AOB diameterko salbo.
3. Jatchini angleko bak 8 dake sualbo. (360÷8=45°)
4. AB diameterna 45° chel'grike CD, EF, GH, diameterrangko salbo.
5. BC, CE, EG, AG, AD, DF aro FG ko nangrimatbo.
6. Circleko kimite galbo.

Da·o BCEGADFH octagon ge·sa ong·aha.

$$BC=CE=EG=GA=AD=DF=GH.;$$
$$\angle A=\angle D=\angle F=\angle H=\angle B=\angle C=\angle E=\angle G=45°.$$

EXERCISE—6

1. Ka·mao janapgipa polygonrangko noksa sale mesokbo.
   (a) pentagon. (b) Hexagon. (c) Octagon.
2. Ka·mao janapgipa polygonrangni central angle (bijatchigipa angle) badita ong·na nanga hisab ka·e mesokbo.
   (a) Pentagon. (b) Hexagon. (c) Octagon.
   (d) Decagon.

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